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Supreme Court of the United States

OCTOBER TERM, 1938.

Nos. 466 and 479.

HONOLULU OIL CORPORATION, LTD. (a corporation), and
M. O. JOHNSTON OIL FIELD SERVICE CORPORATION
(a corporation),

Petitioners,

vs.

ERLE P. HALLIBURTON and HALLIBURTON OIL WELL
CEMENTING COMPANY (* corporation),

Respondents,

and

ERLE P. HALLIBURTON and HALLIBURTON OIL WELL
CEMENTING COMPANY (a corporation),

Cross-Petitioners,

vs.

HONOLULU OIL CORPORATION, LTD. (a corporation), and
M. O. JOHNSTON OIL FIELD SERVICE CORPORATION
(a corporation),

Cross-Respondents.

ON WRITS OF CERTIORARI TO THE UNITED STATES CIRCUIT
COURT OF APPEALS FOR THE NINTH CIRCUIT.

BRIEF FOR THE RESPONDENTS.

(And Cross-Petitioners)

FREDERICK S. LYON,
WILLIAM H. DAVIS,
LEONARD S. LYON,
HENRY S. RICHMOND,
BEN F. SAYE,

Attorneys for Respondents.

SUBJECT MATTER INDEX

	PAGES
STATEMENT OF THE CASE	2
<i>The Questions Presented</i>	2
<i>The Decisions in the Patent Office and in the District Courts</i>	3
The Issue as to Validity of the Method Claims	5
The Issues as to the Apparatus Claims	6
The Disclosure of Plaintiffs' Patent	7
<i>The Method of Testing Disclosed in the Patent</i>	10
<i>The Testing Tool Disclosed in the Patent</i>	12
<i>The Claims in Issue</i>	13
<i>The Utility and Practicability of the Invention</i>	15
Summary of Argument	16
The primary features of Simmons' invention	16
The series of steps constituting the method	16-17
The Franklin patent of 1882	17
The Cox and Edwards patents	18
Judge Wilbur's finding of facts upon which the validity of the method claims was predicated	18-20
Our position with respect to the apparatus claims	20

ARGUMENT	PAGE
The Disclosure of Franklin's Patent 263,330 of 1882	21
Franklin's Disclosure Does Not Anticipate Simmons' Method	21
<i>The Sequence and Timing of the Steps of Franklin's Procedure and Simmons' Method Are Antagonistic</i>	23
<i>Franklin's Apparatus Is Not Adapted to Carry Out Simmons' Method</i>	25
<i>The Art of Drilling Wells as it Existed in 1882</i>	27
<i>The Location of the Packer Referred to in Franklin's Patent</i>	27
<i>Franklin's Apparatus, Even as Defendants Interpret It, Is Insufficient for Simmons' Purpose in Four Vital Respects</i>	29
Franklin's Apparatus Does Not Anticipate Simmons' Combination Claims 9-17 and 19	31
The Unsuccessful Two-String Testers for Rotary Drilling Proposed by Cox and Edwards	37
<i>The Disclosure of the Cox Patent 1,347,534</i>	42
<i>Edwards Patent 1,514,585</i>	48
<i>The Cox and Edwards Patents Emphasize the Inventive Character of Simmons' Contribution</i>	50
<i>Other Well Testers of the Prior Art Further Emphasize the Novelty of Simmons' Innovation</i>	52
The Wide Industrial Use of the Simmons Invention	53
<i>Initial Apprehensions of Well Owners</i>	53
<i>Successful Demonstrations Under Halliburton's Guaranty</i>	54
<i>General Adoption</i>	54

The Effort of Edwards to Appropriation the Simmons Invention 57

Defendants' reference to defense of prior invention by Philp or Carter rejected by the courts of the Fifth Circuit and abandoned in the instant case 60

Infringement 61

The Method Claims 61

The Apparatus Claims 62

Defendants' Assignments of Error and Points of Argument 67

Simmons' process is not the mere function or effect of an apparatus or tool 68

Simmons' method is not the application of an old device in an old manner to an analogous subject matter. It rests upon a new manner of application 70

Simmons' method claims do not depend for their novelty upon mechanical limitations but upon a new procedure involving the use of a defined apparatus 71

Under the decisions of this Court Simmons' method is a proper subject of patent protection 74

THE LAW APPLICABLE TO THIS CASE 76

Item 1. Novelty is the primary test of invention 76

Item 2. Evidence corroborating finding of novelty: Recognized need, failure of previous attempts to solve the problem, successful solution by the patentee, immediate adoption of patentee's solution to the exclusion of former methods 77

Item 3. Solution of problem in a manner that had been thought impossible by the art demonstrates the novelty of the invention	80
Item 4. Presumption of validity arising from issuance of patent strengthened where patent has undergone close scrutiny in interference proceedings	80
Item 5. The law requires, not indefiniteness, but certainty in order to defeat the novelty of a patent for a valuable improvement in the art	80
Item 6. Slight changes are enough to support the patentability of the changed apparatus, if the changes were dictated by a new purpose first disclosed by the patentee	81
Item 7. Ex parte tests are given little weight as evidence	82
Item 8. Success is not anticipated by failure	82
Item 9. The persuasive effect of widespread success of the patented invention is not to be denied because the specific embodiment of the invention may be improved upon as the result of experience	82
Item 10. The defense of prior invention must be established by the defendant beyond a reasonable doubt	83
Items 11, 12, 13 and 14 relate to infringement	83-4
Item 15. Reference to structure may be included in a method claim	84
CONCLUSION	88
APPENDIX—Findings of Judge Bryant in the Case of Erle P. Halliburton et al. v. Johnston Formation Testing Corp. et al. (D. C., E. D., Texas)	89

TABLE OF CASES

	PAGES
Agawam Co. v. Jordan, 7 Wall. 583, 597 _____	80
Altoona Publix Theatres v. American Tri-Ergon Corp., 294 U. S. 477, 55 S. Ct. 455 _____	59
The Barbed Wire Patent Case, 143 U. S. 275, 282-4 _____	82, 83
Beedle v. Bennett, 122 U. S. 71, 78 _____	75
Cameron Septic Tank Co. v. Village of Saratoga Springs (C. C. A. 2), 159 Fed. 453, 463, 464 _____	69
Cantrell v. Walliek, 117 U. S. 689, 695-6 _____	83, 84
Carnegie Steel Co. v. Cambria Iron Co., 185 U. S. 403, 424 _____	68, 79, 81, 82
Carson v. American, etc., Co. (C. C. A. 9), 4 F. (2d) 463, 465-6 _____	82
Chadeloid Chemical Co. v. Wilson etc. Co. (D. C., S. D., N. Y.), 220 Fed. 681, 682 _____	82
Cimiotti Unhairing Co. et al. v. Comstock Unhairing Co., 115 Fed. 524 _____	81
Cochrane v. Deener, 94 U. S. 780, 788 _____	74, 75, 83, 84
Coffin v. Ogden, 18 Wall. 120, 124 _____	83
Cohn v. United States Corset Co., 93 U. S. 366, 370 _____	81
Consolidated Valve Co. v. Crosby Valve Co., 113 U. S. 157, 179 _____	79, 81, 82
Corning et al. v. Burden, 15 How. 252, 268 _____	75
Cotton-Tie Company v. Simmons, 106 U. S. 89, 92 _____	85
Deering v. Winona Harvester Works, 155 U. S. 286, 301 _____	83
DeForest Radio Co. v. General Electric Co., 283 U. S. 664, 682, 685 _____	76, 77, 78
Diamond Rubber Co. v. Consolidated Tire Co., 220 U. S. 428, 425 _____	77, 80
Duer v. Corbin etc. Co., 149 U. S. 216, 223-4 _____	83

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558

38

99



Eames v. Andrews, 122 U. S. 40, 54	75, 80
Edwards v. Johnston etc. Corp., 44 F. (2d) 607.....	4, 57, 58, 59
Edwards v. Johnston etc. Corp. (C. C. A. 5), 56 F. (2d) 49-50	48
Eibel Process Co. v. Minn., etc., Co., 261 U. S. 45, 52, 68	77, 79, 80, 82
Electric etc. Co. v. General Electric Co. (C. C. A. 2), 88 F. (2d) 11, 16	84
Expanded Metal Co. v. Bradford, 214 U. S. 366, 383	68, 76, 78, 83
General Talking Pictures Corp. v. Western Electric Co., 304 U. S. 175, 177-8	2, 61
Hall Signal Co. v. General Ry. Signal Co. (C. C. A. 2), 169 Fed. 290	82
Halliburton et al. v. Honolulu Oil Corp. (C. C. A. 9), 98 F. (2d) 436, 438-9	1, 3, 5, 7, 9, 19, 20, 23, 24
Hildreth v. Mastoras, 257 U. S. 27, 34-5	79, 80, 83
Hobbs v. Beach, 180 U. S. 383, 393	79, 82, 84
Holland etc. Co. v. Perkins etc. Co., 277 U. S. 245, 255	77
Johnston Formation Testing Corp. et al. v. Hallibur- ton, et al. (C. C. A. 5), 88 F. (2d) 270	2, 3, 4, 5, 39, 58, 77
Keyes v. Grant, 118 U. S. 25, 28	75, 85
Keyes v. Pueblo Smelting, etc. Co., 36 Fed. 179	85
Keystone Mfg. Co. v. Adams, 151 U. S. 139, 144	79
Kuehnsted v. Farbenfabriken etc. Co. (C. C. A. 7), 179 Fed. 701, 707	82
Lampson etc. Co. v. Hellman (C. C. A. 7), 123 Fed. 416, 419	84
Lawther v. Hamilton, 124 U. S. 1	73, 86
Loom v. Higgins, 105 U. S. 580, 591	78

	PAGES
Machine Co. v. Murphy, 97 U. S. 120, 124-5	84
McKee et al. v. Graton & Knight Co. (C. C. A. 4), 87 F. (2d) 262, 263	80
Minerals Separation v. Hyde, 242 U. S. 261	75, 77, 79
Mitchell v. Tilghman, 19 Wall. 287, 390	80
Mowry v. Whitney, 14 Wall. 620, 629	85
Naivette v. Bishinger (C. C. A. 6), 61 F. (2d) 433, 436.....	69
National Battery Co. v. Richardson Co. (C. C. A. 6), 63 F. (2d) 289, 292	80
National Cash Register Co. v. Boston etc. Co., 156 U. S. 502	81
National Tube Co. v. Mark. (C. C. A. 6), 216 Fed. 507, 521	84
New Process etc. Co. v. Maus, 122 U. S. 413, 423-7	77, 79
O'Reilly v. Morse, 15 How. 62, 115-16	85
Pennsylvania R. R. v. Locomotive Truck Co., 110 U. S. 490, 494	70
Potts v. Creager, 155 U. S. 597, 608	76, 79
Radio Corp. v. Radio Engineering Labs., 293 U. S. 1, 7	80, 83
Richards v. Chase Elevator Co., 159 U. S. 477, 486	74
Seabury v. Am Ende, 152 U. S. 561, 567	77
Sessions v. Romadka, 145 U. S. 29, 44	79, 83
Seymour v. Osborne, 11 Wall. 516, 555	81
Skelly, etc. Co. v. Universal, etc. Co. (C. C. A. 3), 31 F. (2d) 427, 431	81
Smith v. Goodyear, etc. Co., 93 U. S. 486, 492-7	77
Smith v. Snow, 294 U. S. 1, 20	83, 84, 85
Straub v. Carapbell (C. C. A. 3), 259 Fed. 570, 571	80
Symington v. National Casting Co., 250 U. S. 383, 385.....	84
The Telephone Cases, 126 U. S. 1, 532	75, 82
Tempeo Co. v. Apco Co., 275 U. S. 319, 324-5, 328	83, 84
Tilghman v. Proctor, 102 U. S. 707, 728	75, 81, 83, 84
Topliff v. Topliff, 145 U. S. 156, 164	79, 81, 82

Voices v. Uneeda Doll Co. (C. C. A. 2), 32 F. (2d) 673, 675	84
1900 Washer Co. v. Kraemer (C. C. A. 3), 169 Fed. 629, 633-4	84
Waxham v. Smith, 294 U. S. 20, 21-2	75, 83, 86

STATUTES CITED

Revised Statutes, Section 4894 (U. S. C., Title 35, Sec. 37)	3
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IN THE
Supreme Court of the United States

OCTOBER TERM, 1938

HONOLULU OIL CORPORATION, LTD. (a corporation), and M. O. JOHNSTON OIL FIELD SERVICE CORPORATION (a corporation),

Petitioners,

vs.

No. 466

ERLE P. HALLIBURTON and HALLIBURTON OIL WELL CEMENTING COMPANY (a corporation),

Respondents,

and

ERLE P. HALLIBURTON and HALLIBURTON OIL WELL CEMENTING COMPANY (a corporation),

Cross-Petitioners,

vs.

No. 479

HONOLULU OIL CORPORATION, LTD. (a corporation), and M. O. JOHNSTON OIL FIELD SERVICE CORPORATION (a corporation),

Cross-Respondents.

BRIEF FOR RESPONDENTS

(Plaintiffs below)

This cause is here on writs of certiorari issued to the Circuit Court of Appeals for the Ninth Circuit because of conflict between the decision of that court (98 F. (2d) 436 and 1, 524)* and an earlier decision of the Circuit Court

*The record will be referred to by giving the volume in Roman numerals followed by the page in Arabic numerals.

of Appeals for the Fifth Circuit in a suit brought by plaintiffs below against Johnston Formation Testing Corporation and Edgar C. Johnston (88 F. (2d) 270).

STATEMENT OF THE CASE

In Case No. 466 a writ issued on petition of defendants below, Honolulu Oil Corporation, Ltd., and M. O. Johnston Oil Field Service Corporation, asserting that the Ninth Circuit Court of Appeals erred in holding valid the two method claims of respondents' patent 1,930,987 granted October 17, 1933 to John T. Simmons for a "Method and Apparatus for Testing the Productivity of Formations Encountered in Wells". The question presented by defendants' petition is:

Are the method claims 8 and 18 of plaintiffs' patent 1,930,987 invalid?*

In Case No. 479 a writ issued on cross-petition by plaintiffs below, Erle P. Halliburton and Halliburton Oil Well Cementing Company, to review the questions of validity and infringement of the apparatus claims. As set forth in plaintiffs' cross-petition these questions are:

(1) Are apparatus claims 9, 10, 11, 12, 13, 14, 15, 16, 17 and 19 of United States Letters Patent No. 1,930,987, valid?

(2) Are such apparatus claims infringed by the accused device employed by the defendants, Honolulu Oil Corporation, Ltd., and M. O. Johnston Oil Field Service Corporation?

*The reasons assigned by defendants for allowance of the writ are limited to that question (petition pp. 5-6). In the opening brief now filed on behalf of defendants attempt is made to assert an additional issue of non-infringement of the method claims. This is contrary to the rule of this Court which limits the review on certiorari to questions specifically brought forward by the petition for the writ (*General Talking Pictures Corp. v. Western Electric Co.*, 304 U. S. 175, 177-8).

The conflict of decision in the two Courts of Appeals

The Ninth Circuit Court of Appeals held the method claims (8 and 18) valid and infringed and the apparatus claims (9-17 and 19) invalid because of anticipation by the patent to Franklin 263,330 of 1882 (I, 530 and 98 F. (2d) 436, 438-9). In the Fifth Circuit the method claims were held invalid for lack of invention over the Franklin patent in view of the disclosures of the later patents to Cox 1,347,534 of 1920 and Edwards 1,514,585 of 1924 (88 F. (2d) 272).^{*} As to the apparatus claims it was held that while they might define "a simplifying improvement on which a combination patent may rest" yet it "is not a basic and pioneer invention" of such character as to be infringed by the accused testing tool of the defendants in that case (88 F. (2d) 272)—the same tool that is used by defendants in the instant case.

The decisions in the Patent Office and in the District Courts

The application for the Simmons patent was filed on February 10, 1926 (II, 1-26). A more complete description and additional claims were presented by an amendment filed March 25, 1926 (II, 29-47) accompanied by a supplemental oath of Simmons (II, 48).^{**} While pending before the patent office the application was involved in numerous

^{*}The expression in the Opinion was "Especially after the disclosures of Cox . . . and Edwards . . . we do not think that recurrence for this new use to what is in substance the simple apparatus of Franklin ought to be the foundation for broad method claims such as are here put forth. We hold them, while perhaps not strictly anticipated, to involve no such invention as entitles to monopoly" (88 F. (2d) 270, 272).

^{**}This was done within the period of six months allowed within which an application after filing "shall be completed and prepared for examination".

"Sec. 4894. (U. S. C., title 35, sec. 37.) All applications for patents shall be completed and prepared for examination

(Footnote continued on next page.)

that is, that such a device could be set in a well containing drilling fluid while there was no circulation thereof long enough to make a test. It substituted a much better process than had hitherto been in use. The patentee discovered that a well could be safely tested by the lowering of a single string of pipe equipped with a valve packer and strainer and that it was not necessary to set the casing permanently and bail out the drilling fluid, or, if a test were attempted without permanently setting the casing that it was not necessary to provide an extra string of pipe for circulation of the drilling fluid. See, *Pacific Contracting Co. v. Bingham C. C.*, 62 F. 281; *Tarr v. Folsom*, Fed. Cas. No. 13,756; *Lawther v. Hamilton*, 124 U. S. 1, 8 S. Ct. 342, 31 L. Ed. 325."

This conclusion that the method claims are valid was reached after the court had found in the Franklin device an anticipation of the apparatus claims of plaintiffs' patent. Judge Wilbur said (I, 530):

"Although we hold that the Franklin device anticipates the combination claims of appellants' patent and could be used in carrying out the patented process, this holding does not negative invention as to the process claims in suit. The apparatus used in carrying out a process may be old and yet the process valid. *Expanded Metal Co. v. Bradford*, 214 U. S. 366, 29 S. Ct. 652, 53 L. Ed. 1034, 1040; *Carnegie Steel Co. v. Cambria Iron Co.*, 185 U. S. 403, 22 S. Ct. 698, 46 L. Ed. 968."

The Issues as to the Apparatus Claims.

As to the *validity* of the apparatus claims 9 to 17 and 19, the primary question is whether they are anticipated by the apparatus disclosed in the Franklin patent. That was the conclusion reached by the Ninth Circuit Court of Appeals for the reasons set forth by Judge Wilbur in his opin-

ion. (98 F. (2d) 437-9; I, 526-30). Plaintiffs (cross-petitioners in case No. 479) have asked this Court to review that conclusion.

Plaintiffs' position is that the apparatus disclosed in the Franklin patent, which was admittedly not intended for Simmons' purpose, is not adapted to that purpose without significant change in the apparatus; that even a very slight change made in the Franklin apparatus is enough to give the changed apparatus the status of patentable invention if the change was foreign to Franklin's purpose and was dictated by the new purpose which Simmons had conceived.

As to *infringement* of the apparatus claims, the evidence is that the accused testing tool differs from the specific form of device described in the Simmons patent only in the mechanical structure of the valve mechanism. These details of form are matters of subordinate invention covered by claims 1 to 7 of Simmons' patent. The departure in the accused testing tool from these details does not destroy its identity with the generic combination defined in the apparatus claims 9 to 17 and 19 here charged to be infringed.

The Disclosure of Plaintiffs' Patent

The invention disclosed in the Simmons patent comprises a method and apparatus for testing the productivity of formations encountered in drilling oil and other deep wells. Natural oil occurs in geological strata, ordinarily called "formations", well below the surface of the earth. Since there is considerable variation in the productive capacity of different oil-bearing formations, some means of ascertaining the commercial productivity of the different layers of oil sand encountered during a drilling operation is highly desirable. In short, one of the drillers' major problems is to know when to stop further drilling and complete his well for production. In rotary drilling this problem

is accentuated, as the patent points out (II, 4; 1/9-37),* by the presence of the drilling fluid. The drilling fluid is a mud-laden fluid which may be artificially produced and introduced into the well (I, 301) or may be created by the action of the drill where the formations encountered are such as to make a mud fluid of the proper consistency (I, 489). The mud is pumped from the top of the well, passing down through the drill pipe and out at the bottom, and returning up through the annular space between the drill pipe and the walls of the hole, thereby maintaining a continuous circulation (I, 46, 154, 267). The function of the circulating mud is to support the walls of the hole and prevent cave-ins (I, 39, 46, 156, 267, 490), to plaster the walls of the hole and prevent the fluids in the formations penetrated from entering the well (I, 38, 156, 267, 301, 490), to remove any cuttings from the bit or cavings dislodged from the walls of the well (I, 46, 154, 267, 490), and finally to prevent the tools from sticking or "freezing" in the well (I, 156, 267). The pressure exerted by the weight of this drilling fluid is such as to prevent the flow of oil or gas into the well when an oil-bearing formation is uncovered and consequently prevents the operator from determining the presence of oil in such a formation by direct observation. However, the cuttings of the drill which are raised to the top of the well may be examined, or a sample of the formation material itself may be cored out by means of a core barrel and a study of these samples will give the operator some idea as to whether the formation being drilled contains oil. These crude tests cannot be relied on to demonstrate the *productivity* of a formation, but will enable the driller to determine whether or not a productivity test should be made (I, 154-5).

The patent after describing this use of drilling fluid by the rotary method and how it obscures any indication of

*In referring to the patent in suit we shall adopt the shorthand method of indicating the page and line as in the text (1/7-32), meaning page 1, lines 7 to 32.

the productivity of formations penetrated by the drill, or even the existence of any "cognate fluid" such as oil, water or gas (II, 4; 1/23-32), describes the prior method of testing and its deficiencies as follows (1/33-74):*

"Under the present practice, when making such a test, it is necessary to remove the mud-laden fluid from the well bore until the hydraulic head of liquid within the well is sufficiently below the head of the cognate fluids in the formation in order to allow this latter fluid to enter the well bore. In order that this mud-laden fluid may be removed from the well bore without danger of the well caving in, it is the general practice to set a string or strings of casing in the well so that this string or strings of casing may support the wall of the well when the mud-laden fluid is withdrawn. The lower portion of at least the inside string of casing is perforated in order that the fluids from the formation may enter the casing after the removal of the mud-laden fluid. If a water sand has been encountered above the formation to be tested, it is necessary to run in a string of casing and cement or otherwise seal its bottom to the sides of the well bore at a point below the known water level, in order to protect the formation being tested from this upper water strata. This string of casing is then known as a water string. In testing a well, the hole below the bottom of this water string is then protected by another string set inside the water string.

"In case the test develops that the formation tested is barren or not commercially productive or contains water and it is therefore desired to deepen the hole, it is necessary to refill the hole with mud-laden fluid, to remove if possible the inner perforated string, and to resume drilling. The cemented water string, however,

*This is the method of testing prior to the patented method which was characterized by Judge Wilbur as "both expensive and detrimental to the well" (98 F. (2d) 437; I, 525).

must be left in the hole, which not only entails the cost of this string but decreases the size of the hole which can be thereafter drilled. If the testing operation is repeated with the setting of successive water strings, the size of the hole may ultimately become too small for successful drilling operations and attempts to drill deeper must therefore be abandoned.”*

*The Method of Testing
Disclosed in the Patent*

Having described this standard but unsatisfactory method of testing, the patentee states (1/75-101) that his object is to provide a method and apparatus for testing formations penetrated by the drill “without the necessity of removing the mud-laden fluid from the well bore” (1/82-4) by “obtaining a sample of the cognate fluid in the formation to be tested without substantial contamination of such sample” (1/98-101) which “does not require the setting of a water string above the formation to be tested and thus permits the testing of a well without involving the cost of such water string” (1/88-91) and “does not entail decreasing the size of the well bore.” (1/95-6).

Describing his new method more particularly, the patentee goes on to say that he establishes “an empty chamber or conduit in the well bore adjacent the formation to be tested without removing the mud-laden fluid from the well, and then permit[s] the cognate fluids of the formation to discharge into said empty chamber or conduit” (1/104-9). Preferably the empty chamber, which may be the hollow drill stem ordinarily used for drilling the well, extends from the formation tested to the top of the well. If the cognate fluids of the formation are under sufficient pressure, the well may commence producing through

*This description of the prior standard method of testing is fully confirmed by the record (I, 44; and defendants’ witness Heitmeyer I, 375-6).

this conduit.* If not, a sample is taken by the procedure described in the specification and claimed in the method claims. The cognate fluids of the formation will flow, upon the opening of the valve, into the empty chamber or conduit. The operator then turns the flow pipe at the top of the well to close the valve and entrap whatever fluid (whether oil or salt-water or both) has entered the empty chamber. "Following the entrance of the cognate fluid into the empty conduit or chamber, the apparatus may be elevated to the top of the well with the entrapped fluid content. The conduit being closed, the mud-laden fluid in the well is prevented from entering the conduit and contaminating the sample or otherwise interfering with the testing process" (2/13-20). To relieve the cognate fluid from the hydraulic pressure of the drilling fluid, and so permit it to flow under its natural pressure into the sampling device, the invention "also preferably embodies a means by which the formation to be tested may be sealed off from the hydraulic pressure of the mud-laden fluid standing within the well during the testing operation", and "by which the hydraulic pressure of the mud-laden fluid in the well may be reimposed upon the formation after the completion of the testing operation" (2/21-9). And the inventor "also provides a method and apparatus by which a formation may be tested through the penetration of the lower end of the testing apparatus into a so-called 'rat-hole,'** or an extension of the well bore of

*Defendants in their brief (pages 4 and 26-7) quite erroneously say that this represents the "preferred form" of Simmons' method. Of course, any well driller prefers to strike such a "gusher"; but Simmons' method is not used or claimed where no sample is entrapped and lifted to the surface in the test string.

***In drilling a well it is customary to drill a small hole ahead of the regular sized hole in which the casing is to be set, for the purpose of exploring with this pilot hole, called a 'rat-hole,' the formations below there, coring and catching the cuttings" (Halliburton I, 48 and see I, 50 and 157).

reduced diameter, . . . leaving . . . a seat above the formation to be tested" (2/33-9).

The Testing Tool

Disclosed in the Patent

The testing tool disclosed as an example of an instrument adapted to carry out the method, consists of two principal elements (1) an empty chamber or conduit which may be the usual hollow drill stem 23, suitable to "be lowered into a well bore and, when so lowered, provide an empty chamber adjacent the formation to be tested" (2/64-6) and (2) a testing head or tool, which "may be connected in the same manner as a bit to the drill stem and run into the hole in the same manner" (3/93-5), comprising a valve body 4 forming a rotatable valve "which is adapted to normally close such chamber or conduit 23 from communication with the mud-laden fluid within the well and adapted to be operated when the device has been lowered into position within the well hole to permit the cognate fluids of the formation to discharge into the empty chamber or conduit provided by the pipe 23" (2/73-80), and carrying (1) a packer 15 "for sealing off the formation to be tested from the pressure of the head of mud-laden fluid within the well bore" (2/82-4) and (2) an inlet member 12 below the packer and valve "through which the fluids from the formation to be tested may be permitted to discharge into the conduit or chamber formed by the casing or pipe 23 when the valve is operated as later described" (2/60-90), i. e., "manipulated as desired from the surface of the well to close or open the empty chamber or conduit provided by the pipe or casing 23" (3/25-9).

In the remainder of the specification (3/35-117) the patentee rehearses the manipulation of his testing tool to carry out his method, explaining that the device must be let down into the well with the valve closed to prevent the drilling fluid standing in the well from entering the pipe "as, of course, the entry of such fluid would interfere with

the purity of the sample sought", and would also "impose a hydraulic head upon the formation to be tested when the valve is opened and thus defeat the object of the testing method". He emphasizes (3/93-5) that "the valve and packer as constructed may be connected in the same manner as a bit to the drill stem and run into the hole in the same manner, making it possible within a very few minutes to gain the sample and pull it to the surface"; that (3/98-113) as soon as the packer, which "operates to remove the pressure of the mud-laden fluid in the well from the cognate fluids of the formation" is lifted from its seat to remove the testing tool from the well "the pressure of this mud-laden fluid is again immediately reimposed upon the formation, thus preventing further discharge of the fluids of such formation. In this manner the well is always under control and no danger of blowouts encountered",* and that (3/113-17) the conduit is closed during the withdrawal of the tool so that "the mud-laden fluid within the well cannot contaminate the sample or otherwise interfere with the testing operation".

The Claims in Issue

The method of testing thus disclosed is defined in the two method claims 8 and 18 which read as follows:

"8. A method of testing the productivity of a formation encountered in a well containing drilling fluid, which includes lowering an empty string of pipe into the well through the drilling fluid to adjacent the formation, the pipe carrying a packer and having a valved inlet at its lower end which is closed while the pipe

*The nature and disastrous effect of a blow-out which may occur sometimes in testing a well which has a very high pressure in the sand being tested is described by petitioners' witnesses O'Neill at I, 167 and Heitmeyer at I, 375; and see Peckham's Report, II, 438, and Chamberlain II, 447.

is being lowered, setting the packer above the formation to seal off the drilling fluid from the formation, opening the valved inlet after the packer is set to permit cognate fluid from the formation to enter the pipe, closing the valved inlet against the entrance of fluid from the well by movement of the pipe, raising the pipe so closed to remove an entrapped sample and the packer from the well."

"18. A method of testing the productivity of a formation encountered in a well containing drilling fluid involving the insertion of only a single string of pipe into the well to make a test, which includes lowering a test string into the well through the drilling fluid with a packer carried by the string and a valve inlet at the lower end of the string closed against the entrance of fluid from the well, setting the packer above the formation and opening the valve to permit cognant fluid from the formation to enter the inlet, closing the valve to prevent the subsequent entrance of fluid from the well through the inlet and releasing the packer, and raising the test string with the inlet closed against entrance of fluid from the well to remove an entrapped sample."

The testing tools adapted to the carrying out of this testing method are defined in various forms of expression in the apparatus claims 9-17 and 19. It is sufficient to refer to claim 15 for example:

"15. Apparatus for testing the productivity of a formation encountered in a well containing drilling fluid, comprising a single empty string of pipe to be lowered into the well through the drilling fluid to adjacent the formation to be tested, a packer lowered into the well by said string of pipe for sealing off the drilling fluid from the formation to be tested, said packer adapted to be positively pressed against the walls of the formation to seal off the same, means at the lower end of said string of pipe to receive fluid from said formation including an inlet opening into said pipe

below said packer and a valve structure for controlling the inlet, said valve structure having a relatively stationary part connected to the packer and a relatively movable part connected to the pipe."

The Utility and Practicability of the Invention

It will be observed that when the operator has thus entrapped in the pipe and brought to the surface an uncontaminated sample of the cognate fluids (whether oil or salt-water or both) in the formation to be tested, he can ascertain from it the productivity of the formation. What the operator wants to know is not merely whether the formation bears oil or gas, which is ordinarily already known from an examination of the well cuttings or from the taking of a core, but how much oil or gas the well would produce, if finished at that point (I, 39, 47-8). The Simmons invention, by recovering an entrapped and uncontaminated sample of the fluids forced into the pipe under the natural pressure within the formation, when relieved of the hydraulic pressure of the drilling mud, enables the operator to learn how much oil will flow from a formation in any given time (I, 39, 42). This provides him with a measure of the possible production of the formation (sand) tested (patent 1,89-90), something entirely new in the art (I, 44). If the test is negative the drilling may be continued, and the loss incident to the useless setting and sealing off of a string of casing has been avoided.

The operation is extremely simple and highly practical. It requires only the time involved in lowering, by the accustomed procedure, the drill pipe 23 carrying the packer and the valve in place of the usual drill bit, taking the test and withdrawing the pipe. It permits the operator to take the sample within a very short time—15 or 20 minutes in common practice (I, 41).

Summary of Argument.

Plaintiffs' patent discloses an invention of unusual importance and merit. This invention is fully described and is claimed in the patent with sufficient breadth to include the defendants' alleged infringement. The case turns on whether, in the light of the prior art and particularly the Franklin patent of 1882, the patent is to be sustained and given the full effect intended for it by the patent office.

The primary features of the Simmons invention which are responsible for its commercial success and which distinguish it from the prior art are:

(1) *The test is made with a single string of pipe without removing the drilling fluid and without maintaining circulation of the drilling fluid.*

(2) *An entrapped and substantially uncontaminated sample is recovered, thereby giving a measure of the productivity of the formation tested.*

The discovery that this could be done and how to do it was entirely new. It is a result never before accomplished. The procedure of entrapping and withdrawing a substantially uncontaminated sample as Simmons conceived and developed it reduces to a very few minutes the time that the test pipe stands in the well and eliminates the need of leaving the pipe in the well during the time that would be required for pumping or bailing. Thus Simmons found a way to operate so quickly that the test could be made while the circulation of drilling fluid was suspended, and yet escape the danger of "freezing" the test tool in the hole. No one had ever foreseen this possibility, or any way of accomplishing it.

The method by which Simmons accomplished this new result consists of a series of steps in a related sequence and properly timed, as follows: (1) establish an empty chamber

or conduit in the well bore adjacent the formation to be tested by lowering a single empty string of pipe having a valved inlet and carrying a packer through the mud-laden drilling fluid standing in the well with the valve closed to adjacent the formation to be tested; (2) set a packer above the formation to temporarily seal off the hydraulic pressure of the drilling mud and permit the cognate fluids in the formation to move under pressure of the natural forces within the formation into the well hole; (3) open the valve long enough to permit the cognate fluids to flow into the empty chamber or conduit; (4) close the valve to entrap the sample and exclude contamination by the mud-laden fluid in the well; (5) release the packer to reimpose the pressure of the mud-laden fluid upon the formation to prevent blow-outs and (6) lift the entrapped and uncontaminated sample of the cognate fluids to the surface for examination. This testing procedure makes it possible "within a very few minutes to gain the sample and to pull it to the surface."

The Franklin patent 263,330 of 1882, which is defendants' main reliance, discloses no such method. It discloses a valve casing and valve for permanent installation in the flow tube of a finished dry-cased well* to control and regulate production. Franklin neither considered nor solved Simmons' problem. He did not discover how to test the productivity of a well full of rotary drilling mud, or conceive of making a test so quickly as to permit interruption of the circulation of the drilling fluid and yet escape the danger of "freezing" the testing tool, for rotary drilling was unknown at the date of Franklin's patent: oil wells were drilled and produced dry. There is in the Franklin patent no suggestion of taking an entrapped sample. The series of steps followed by Franklin is antagonistic to the series of steps of the Simmons method. The two procedures differ at each step (see *post* pp. 25-67).

*A dry-cased well is a well in which substantially all fluids other than the cognate fluids from the oil-bearing formation are excluded (see *post* p. 29).

interferences wherein the patentability of the invention over the prior art, including the Franklin, Cox and Edwards patents here relied upon, was fully contested. The claims were allowed in the first instance by the primary examiner (II, 80). The invention was subsequently held patentable by the law examiner in deciding a motion to dissolve an interference (II, 195-202). It was again held patentable by the Board of Appeals in a second interference (II, 146-52). Immediately following the grant of the patent, suit for infringement was filed in the United States District Court for the Eastern District of Texas. The district court (Judge Randolph Bryant) held the patent valid over the same prior patents and infringed by the same method and apparatus used by defendants in this case (see letter to counsel II, 228-9; interlocutory decree II, 215-21 and findings printed as a supplement to this brief). Following the decision of Judge Bryant the instant case was tried before Judge Cosgrave in the Southern District of California. Judge Cosgrave disagreed with the patent office examiners, the Board of Appeals and Judge Bryant and held the patent invalid as to both the method and apparatus claims (I, 20 and 18 F. Supp. 58). Thereafter the decision of Judge Bryant upholding the patent was reversed by the Fifth Circuit Court of Appeals, in the decision already referred to (88 F. (2d) 270). The decision of Judge Cosgrave and the decision of the Fifth Circuit (written by Judge Sibley) adverse to the Simmons patent, were greatly influenced, to the prejudice of these plaintiffs, by the view which had been taken of the Franklin patent in a decision by Judge Hutcheson in a suit* on an

(Footnote continued from previous page.)

within six months after the filing of the application, and in default thereof. . . . they shall be regarded as abandoned by the parties thereto, unless it be shown to the satisfaction of the Commissioner of Patents that such delay was unavoidable: . . . etc.."

*Edwards v. Johnston Formation Testing Corp., 44 F. (2d) 607; aff'd C. C. A. 5, 56 F. (2d) 49.

earlier patent to Edwards (see I. 21, 22; 88 F. (2d) 271). At the time that suit was before the courts the Simmons patent had not issued. It was held in the patent office by interferences with Edwards and others. The present plaintiffs, owners of the Simmons patent, were not parties to that suit. Both parties to it had interests hostile to the Simmons patent, and all knowledge of Simmons and his invention was kept from the courts in that case (see *post* p. 57). After the reversal of Judge Bryant by the Fifth Circuit Court of Appeals the instant case was heard and decided by the Circuit Court of Appeals for the Ninth Circuit in conflict with the decision in the Fifth Circuit.

The issues are those of an ordinary patent case. The case presents no question of patent office practice or of the method by which the patent is being exploited. The patent in suit is the only patent upon the invention, no continuing or divisional application being involved, and plaintiffs are themselves engaged in the business of operating the invention throughout the oil fields of the United States and in foreign countries.

The Issue as to the Validity of the Method Claims.

The issue to be reviewed, as to the method claims, is found in the following quotation from the opinion of the Ninth Circuit Court of Appeals written by Judge Wilbur (98 F. (2d) 439-40; L. 531):

"As we have stated, Simmons faced the problem of providing a method of testing an oil well without removing the hydrostatic pressure necessary for supporting the formation in place. He met this problem by providing a method operating so quickly that the suspension of the circulation of drilling fluid was not substantially greater than that frequently necessary in drilling operations. Franklin neither considered nor solved this problem.

"This discovery constituted invention for it disclosed what had not been thought possible in the art,

substituted a much better process than had hitherto been in use." (I, 531, 98 F. (2d) 439-40).

5. He found that the process solved the problem in a manner that had not previously been thought possible (*post* pp. 42-51 and 53-4).

"This discovery constituted invention for it disclosed what had not been thought possible in the art, that is, that such a device could be set in a well containing drilling fluid while there was no circulation thereof long enough to make a test." (I, 531, 98 F. (2d) 440).

While Judge Wilbur did not find it necessary in sustaining the method claims to rely upon the commercial success of Simmons' method, the evidence establishes that upon Simmons' successful demonstration of his method of testing rotary-drilled wells, his method was immediately adopted and is now in universal use throughout the oil-drilling industry.

We dispute, however, Judge Wilbur's factual finding that Franklin's device could be used in carrying out the Simmons process and, therefore, anticipates the combination claims of plaintiffs' patent. The evidence establishes that there existed in the prior art no testing tool capable of being employed to carry out Simmons' method.

The Franklin apparatus could not be adapted to Simmons' purpose without significant change dictated by the new purpose and manner of application which Simmons had conceived. The Cox device, which is the only testing apparatus of the prior art intended or adapted to entrap a sample, is very different from the Simmons testing tool, and is not an anticipation of the Simmons apparatus claims 9 to 17 and 19. Its complete failure establishes the essential importance of the differences between it and Simmons' successful tool. The Edwards testing tool differed still more from the Simmons tool, and was neither intended nor adapted to entrap a sample. The other testing tools of the prior art, all of which call for the removal of the cog-

nate fluids from the stratum to be tested by flowing, pumping or bailing as distinguished from the entrapment of a sample, emphasize the novelty of Simmons' testing tool and method (see *post* pp. 52-3).

Infringement by defendants' accused method and testing tool is established by comparison of defendants' interrogatory answers with the disclosure and claims of Simmons' patent (*post* pp. 61-5).*

ARGUMENT

The Disclosure of Franklin's Patent 263,330 of 1882

The Franklin patent is defendants' main reliance in their attack on Simmons' patent. It discloses (II, 349) a "Device for Controlling and Regulating the Flow of Oil-Wells". The invention "consists in providing a device which can be connected with the tubing of the well, either within or without the well, but preferably within at a point above the packer, which has within it a damper or valve, which can be opened or closed by turning the tubing part way around" (1/14-19). The device illustrated and described is a valve housing B' enclosing a rotary valve between an upper casting C and a lower casting B. The valve structure may be installed in the flow pipe of a well whose flow is to be controlled and regulated by attaching the upper section of the well tubing to the casting C at A' and the lower section of the well tubing to casting B (1/74-8). The patentee explains that his device is intended to replace two devices then in use for controlling and reg-

*Defendants' assignments of error and points of argument, in so far as they are not covered by the statement of plaintiffs' position in the main body of the "Argument", are discussed (*post* pp. 67-75).

The points of law applicable to the facts outlined above are, for convenience, stated with supporting authorities at the end of the "Argument" (*post* p. 76).

ulating the flow of wells (1) a brittle disk which had commonly been placed in the tubing at one of the lower joints to close the tubing until the disk is broken, after the tubing is installed in the well, by dropping a weight upon it, and (2) the previously used automatic control valves which acted to temporarily close the tubing "for the purpose of allowing the gas to obtain a head, and then opening and allowing the well to flow copiously for a short time, so as to clear it of paraffine, and also to make a well with short pressure of gas obtain sufficient head to flow" (1/20-44). He points out that the brittle disk referred to was "of no service in keeping the tubing closed while drawing it, and, indeed, there is no device to my knowledge, except my own, which will close the tubing while it is being drawn" (1/32-5); and that the earlier flow-control valves were sometimes made so as to operate automatically and placed down in the well, and sometimes the result was obtained by a simple stop cock operated manually and placed on the flow pipe at the top of the well (1/43-7) and he says "My device has to be operated manually, but it may be placed deep in the well, and thereby obtain considerable advantage" and goes on to say that the automatic valve proved defective at times, "and the whole tubing must be drawn." or the automatic valve "may confine the gas too long by being too heavily weighted" (1/48-62), whereas his device, he says, "is free from all complications, being perfectly simple in its construction and operation" (1/63-5).

We find, therefore, in this Franklin patent a disclosure of the permanent installation at some point in the flow pipe of a flowing well of a rotary valve operable by turning the pipe part way around and having a double function (1) to prevent the upward flow through the pipe while the pipe is being installed in the well or while it is being drawn, and (2) to temporarily close the tubing for the purpose of allowing the gas to obtain a head, and then opening it to allow the well to flow copiously for a short time so as to clear it of paraffine, or to make a well of short pressure of gas obtain sufficient head to flow.

Franklin's disclosure does not anticipate Simmons' method.

It is clear that Judge Wilbur was not at fault when he held that (98 F. (2d) 436, 439; I, 530):

"The Franklin device was to be used in a flowing oil well. Such a well, of course, contains no drilling fluid. Moreover, at the time of the Franklin patent, the rotary method of drilling was unknown. The device was evidently intended to be permanently attached to the tubing of the well. There is no suggestion of the last step of the patented process in suit, that is, the taking of an entrapped sample from an incomplete well containing drilling fluid."

Since rotary drilling (with its use of the hydrostatic pressure of the drilling mud to support the formation in place and otherwise facilitate the drilling operation) was not known in Franklin's day, it is clear that Franklin did not face the problem of testing an oil well without removing this hydrostatic pressure. It is equally clear that his procedure did not provide a method of testing which operated so quickly that the test could be made within a time not substantially greater than the period of suspension of drilling operations frequently necessary in rotary drilling; and that he did not disclose that a testing device could be set in a well containing drilling fluid while there was no circulation thereof long enough to make a test, or that a well could be safely tested by the lowering of a single string of pipe equipped with a valve, packer and strainer and that it was not necessary to set the casing permanently and bail out the drilling fluid (see Judge Wilbur's Opinion I, 531).

Judge Wilbur's findings that Simmons did face this problem and did make these discoveries, as expressed in his opinion (98 F. (2d) 439-40; I, 531 and *ante* pp. 5-6)

are not disputed by defendants in their brief.*

Thus it is evident that Judge Wilbur did not err in plaintiffs' favor in his fact findings with respect to the disclosure of Franklin's patent and its relation to Simmons' method. These facts cannot be, and are not by defendants, disputed in any significant item. The legal conclusion that the Franklin patent does not anticipate the Simmons' patent is amply supported by the decisions cited in Judge Wilbur's Opinion (I, 530-32).

It is plaintiffs' submission that on the facts thus established this Court should affirm the decision of the Ninth Circuit Court of Appeals upholding the validity of Simmons' method claims (see Law Items 1 and 2, *post* pp. 76-9).

We proceed to a more detailed examination of the facts established at the trial, with the further submission that such closer examination abundantly confirms the finding of patentable novelty in the Simmons method, and also discloses that the Ninth Circuit Court of Appeals erred in holding that the Franklin patent anticipates Simmons' apparatus claims 9-17 and 19.

The Franklin patent does not disclose a packer on the flow pipe in which the valve is installed. The only mention of a packer is at page 1, lines 16 and 17 where Franklin says that his valve can be connected with the tubing of the well "at a point above the packer". Defendants contend, and Judge Wilbur found, that in conjunction with the common knowledge of the prior art this

*Defendants in their brief take the position that the Franklin apparatus could be used in carrying out Simmons' process (with which Judge Wilbur agreed), and that, contrary to Judge Wilbur's conclusion, its use in that manner did not involve invention, or for other and more technical reasons was not patentable. But defendants do not suggest that there is any evidence that before Simmons' invention any one ever did use the Franklin flow-control apparatus to test a rotary-drilled well, or any other kind of a well.

statement imports a packer on the flow pipe closing off the upper part of the well to build up the gas pressure in the lower part and force the gas and oil up through the flow pipe, and on this ground it was held that the Franklin apparatus could be used in carrying out the Simmons process and anticipates the combination claims of plaintiffs' patent. We deny the validity of this conclusion and have brought it before this Court for review. For the purpose of our discussion of the method claims at this point we are, however, assuming the correctness of Judge Wilbur's conclusion that Franklin's apparatus could be used in carrying out the Simmons process. Even so, it is clear that as Judge Wilbur found, the Franklin disclosure does not anticipate Simmons' method.

The Sequence and Timing of the Steps of Franklin's Procedure and Simmons' Method are Antagonistic.

In the first place the validity of the method claims is confirmed by direct comparison of the sequence and timing of the steps involved in Franklin's intended use of his flow-controlling apparatus with the steps of Simmons' testing method. That comparison shows that the series of steps involved in Franklin's intended use of his apparatus is antagonistic to the series of steps (see *ante* pp. 16-17) by which Simmons controlled and applied the natural forces within the formation to be tested to entrap and remove an uncontaminated sample of the cognate fluids quickly enough to escape the danger of "freezing" his testing tool in the hole, when the test was made through the uncirculated drilling fluid standing in the well.

Thus (1) Franklin's procedure contains no idea of establishing an empty sample chamber for only a few minutes within the well bore adjacent the formation to be tested. On the contrary, his is a permanent installation for a flowing well which does not call for or contemplate the sample chamber with its valve and packer adjacent the formation to be tested. (2) Even if a packer on the flow pipe is found to be

part of the Franklin disclosure (which we deny—*post* pp. 29-31) it is not used to shut off the pressure of any drilling fluid standing in the well thereby freeing the natural pressure on the cognate fluids within the formation. On the contrary, its function is to build up the gas pressure above the cognate fluids for the purpose of causing them to flow up the flow pipe and out of the well (*post* pp. 30-31). (3) In Franklin the valve is not open for only a few minutes, long enough to permit the cognate fluids to move into a sample chamber. On the contrary, it is kept closed for long periods of time to permit the gas pressure to build up in the well and then opened to permit the continuous flow of the oil up the flow pipe out of the well. It is clear that this procedure of bringing oil to the surface if carried out in a well containing a column of quiescent mud would necessarily result in cave-ins which would "freeze" the pipe and destroy the well. (4) The Franklin valve is not closed to entrap a sample and exclude the mud-laden fluid from the well as the sample is withdrawn. On the contrary, Franklin's valve structure is such (see *post* pp. 34-6) that while it will close the flow pipe against the *upward* pressure of the gas in the well during the insertion and withdrawal of the flow pipe, it is not capable of entrapping and holding a sample when the flow pipe is withdrawn. (5) Franklin had no idea of reimposing the pressure of the mud-laden fluid upon the formation to prevent blow-outs. (6) There is in Franklin no idea of entrapping and raising to the surface for examination an uncontaminated sample of the cognate fluids in the formation to be tested.

Thus as compared with Franklin, Simmons discloses a new series of operations constituting a new method or mode of application of known forces to produce a new result. The result was one never before produced, and it involved the wholly new discovery that a sample of the cognate fluids in a formation penetrated during the rotary drilling of a deep well could be recovered without removing or circulating the drilling fluid standing in the well. We confidently submit that no decision of this Court can

be found that denies patentability to such an innovation (Cf. Law Item No. 1—*post* p. 76).

The foregoing discussion has been predicated on the assumption that the Ninth Circuit Court of Appeals was correct in its conclusion that Franklin's apparatus could be used to carry out the Simmons process, as set forth by Judge Wilbur in the court's opinion (I, 526-30). We now proceed to a closer comparison of the Franklin apparatus with the Simmons testing tool, from which it will appear that the court's conclusion in this regard was unsound and that Judge Wilbur was at fault in the factual details upon which that conclusion is predicated.

*Franklin's Apparatus Is Not Adapted
to Carry Out Simmons' Method.*

The essential features of Simmons' testing tool not found in Franklin's patent are (1) a packer so related to the inlet that it may seal off the formation to be tested from the hydraulic pressure of the mud-laden fluid standing within the well during the testing operation, and (2) a valve so positioned with respect to the packer and inlet that when closed it will entrap the entire flow of cognate fluids resulting from the natural pressure in the formation thus relieved from the pressure of the drilling fluid, and (3) so constructed that it will hold and bring to the surface the uncontaminated and undiminished sample.

As we have already mentioned, defendants argue and Judge Wilbur found, that the deficiency may be made up by reference to the general knowledge of the art at the date of Franklin's patent.

*The Art of Drilling Wells
As It Existed in 1882.*

At the date of Franklin's patent, 1882, the modern deep rotary drilled wells were unknown (I, 365). The wells, being comparatively shallow, were drilled by lifting and

dropping a heavy drill bit and "jar" on the end of a cable (see II, 433; 436; 421; 424 and Plate XXXIX, II, 428) without the circulation of any drilling fluid in the well. The very early wells of 1861 (Carll Report of 1877, II, 429, Fig. 1) were drilled and produced "wet" without removing any water that might flow into the well from water-bearing formations above the oil sand. When the well was equipped with a flow pipe for production a seed-bag packer was mounted *on the flow pipe* at the base of the water-bearing formation to shut off the column of water standing in the well from the oil sand (II, 415-17). It shortly appeared, however, that the practice of leaving a column of water in the well was extremely dangerous since whenever the flow pipe and packer were removed for any reason the column of water would force itself into the oil sand and drive the oil away. The practice "finally brought ruin not only on the well itself but on others in the vicinity" (II, 409-10). To relieve this condition in 1868 a new method of operating producing wells was developed (II, 429, Fig. 2). The well was still drilled wet but when an oil sand was encountered the operator, before installing the flow pipe, first lined the well-hole with a small tubular casing extending down the well to a point below the 'lowermost water-bearing stratum. At this point a seed-bag packer or patent water-packer was affixed *around the lower end of the casing* and pressed against the wall of the well thereby shutting off the water above it and holding it trapped between the outer wall of the casing and the walls of the well, away from the oil sand. An air-tight casing head was then affixed to the top of the casing and the flow pipe introduced by an opening in the casing head and lowered down to the bottom of the well. The water standing in the well was then bailed or pumped out and the oil pumped or flowed through the flow pipe (II, 417-20).

A further innovation appeared shortly thereafter. The well of 1878 (II, 429, Fig. 3) was drilled to a point below the water-bearing stratum. The drill was then withdrawn and a relatively large casing introduced into the hole to

line the well. A collar was fitted to the bottom of this casing and the walls of the well were narrowed slightly at this point so that a water-tight joint between the bottom of the casing and the walls of the hole was obtained. The water standing in the well was exhausted by bailing, and drilling was continued in a "dry hole" until the oil-bearing sands were reached (II, 399 and 420-1). By this method the oil-bearing formation was protected even during the drilling operation from the injurious effect of water and the presence of a vein of oil became apparent the moment it had been reached. The advantage of this procedure was so great that, as the Carll Report states:

"As wells are now drilled, a contractor is not allowed to continue his work unless he succeeds in effectually shutting off all water before striking the oil rock" (II, 421).

At about this date, according to the Carll Report, the use of a water-packer in connection with dry-cased wells came into vogue. This water-packer was mounted *on the flow pipe* when the well was prepared for production. It served "either to confine the oil and gas and induce them to flow, or simply to prevent the seepings of salt water which sometimes come in below the casing in quantities so small as to be scarcely noticed while drilling, from reaching the bottom of the well, to the detriment of its oil-production" (II, 422-3; 424-5). The Peckham Report contains an illustration of such a packer installed in a dry-cased well equipped with a casing head (II, 440, Fig. 4).

*The Location of the Packer
Referred to in Franklin's Patent.*

From this review of the art prior to Franklin's patent it will be seen that in wells of that date packers were used on the lower end of the well casing, and they were also used in some instances on the flow pipe when the well was prepared for production. The only disclosure in Frank-

The patents to Cox (1,347,534 of 1920) and to Edwards (1,514,585 of 1924) on which defendants also rely do not disclose or suggest the Simmons invention. On the contrary, they represent prior unsuccessful attempts of others to test a formation encountered in rotary drilling without setting a casing and removing the drilling mud. These testing devices were predicated on the knowledge gained from experience that circulation of the drilling mud cannot be interrupted without the threat of damage to the well due to cave-ins and the danger of "freezing" tools in the hole against removal. Because of this the rotary drilling testing methods disclosed by Cox and Edwards provided for maintaining the circulation of the drilling mud, and for this purpose required the operation of two strings of pipe in the well, one inside of the other, the outer one to maintain the circulation of the mud and the inner one to make the test. The difficulties inherent in such a proceeding combined with other specific defects in the testing methods and apparatus proposed, were so great that the art preferred to stick to the old method of casing and removing the drilling fluid despite its serious disadvantages. The record discloses that these prior attempts had no practical use. The failure of these attempts emphasizes the novelty and inventive character of Simmons' work.

The record fully supports the findings of fact upon which Judge Wilbur predicated his decision sustaining the validity of the method claims. The facts found by Judge Wilbur are of a character which this Court has always considered as establishing the existence of a patentable invention (see Law Items 1, 2, 3 and 4, *post* pp. 76-80). They are as follows:

1. He found that the process of the patent in suit was novel and had not been described or suggested by Franklin; that Franklin had neither considered nor solved the problem met by the process of the patent in suit (*post* pp. 21-25).

"The Franklin device was to be used in a flowing oil well. Such a well, of course, contains no drilling fluid. Moreover at the time of the Franklin patent, the rotary method of drilling was unknown. * * * There is no suggestion of the last step of the patented process in suit, that is, the taking of an entrapped sample from an incomplete well containing drilling fluid." (I, 530-31; 98 F. (2d) 439).

"Franklin neither considered nor solved this problem." (I, 531; 98 F. (2d) 440).

2. He found that prior methods of testing rotary drilled wells were unsatisfactory and expensive (*ante* pp. 9-10; *post* pp. 54-6).

"Prior to the patented method in suit tests were made by cementing a casing in the well and emptying the well of the drilling fluids by bailing and swabbing. * * * This method of testing was both expensive and detrimental to the well * * *." (I, 525; 98 F. (2d) 437).

3. He found that earlier inventors had attempted to solve the problem and had failed (*post* pp. 42-51).

"Earlier inventors had approached the problem with this thought in view and had provided two strings of pipe, an outer string and an inner string. (Patent 1,347,534, granted E. H. Cox, July 27, 1920; patent 1,514,585, granted C. R. Edwards, November 4, 1924). * * * The evidence shows that the use of two strings of pipe as disclosed by these patents was not practical." (I, 525-6, 98 F. (2d) 437).

4. He found that the process of the patent in suit solved this problem (*ante*, pp. 9-10 and 15; *post* pp. 53-6).

"He met this problem by providing a method operating so quickly that the suspension of the circulation of drilling fluid was not substantially greater than that frequently necessary in drilling operations. * * * It

lin's patent as to the use of a packer is in the statement that Franklin's new valve casing is connected with the well tubing preferably within the well "at a point above the packer" (II, 349, lines 12-17). This remark, even when illuminated by reference to the knowledge of the art, does not disclose whether Franklin referred to the packer at the lower end of the well-casing (see Halliburton I, 453-4, and illustration II, 231) or to a packer mounted on the flow pipe when the well was prepared for production (see illustration facing p. 25 of defts.' brief).

Defendants insist, however, that Franklin must have been referring to a packer mounted on the flow pipe, as distinguished from one mounted on the well casing. They say that this is true for two reasons (1) that Franklin intended his device to be used "for the purpose of allowing the gas to obtain a head" (I 38-9) and that the gas could obtain a head *only if a packer on the flow pipe is used*, and (2) that unless the packer were mounted on the tubing to hold the lower portion of the valve against rotation the valve could never be opened. The first of these two arguments was accepted by Judge Cosgrave (I, 21) and by Judge Wilbur (I, 527). Neither Judge mentioned the second one.

Without waiving our submission that, as matter of law, a disclosure so uncertain is not enough to anticipate (*post* p. 31), plaintiffs submit the following factual considerations which are clearly established by the evidence at the trial, and which were either overlooked or improperly put aside by Judge Cosgrave and by Judge Wilbur:

1—The evidence is that dry-cased wells could be and were so constructed with tight casing heads that gas pressure would build up in them, when the flow was shut off as by Franklin's control valve, without any packer on the flow pipe. The Koch patent discloses such a well with a packer on the casing but no packer on the flow pipe, the casing having an air-tight casing head "which will prevent any escape of gas in that direction" (II, 341, column 2) and the use of such tight casing heads was common practice (see Carll's

Report, II, 419, 429, Figs. 2 and 3; Peckham's Report, II, 435-6, 440, Figs. 2 and 3) and still is (I, 483-4). It is therefore clear, and undisputed, that the gas could build up in a dry-cased well without any supplemental packer on the flow pipe. Judge Wilbur rejected this idea on the ground that "it finds no support in the language of the patent" (I, 529). But we submit that in the language of the patent one interpretation finds as much support as the other. Judge Wilbur went on to advance other considerations that made him think that Franklin had not contemplated using his device without a packer on the flow pipe (I, 529). We do not find in the record or in defendants' brief any support for these suggestions.

2—On the second point, as on the first, the evidence is contrary to defendants' contention. The evidence is that merely lowering the flow pipe until it rests on the bottom of the well would anchor the lower valve portion against rotation (see Latham's patent, II, 321, top of second column).

No conclusive argument can be drawn from the prior art or from the patent in favor of either theory and speculation must be substituted for proof. It is equally open to either interpretation and on this point alone plaintiffs submit that the Franklin patent must be discarded as an anticipation of the apparatus claims of Simmons' patent and is seen to be of even less pertinence to the method claims than Judge Wilbur believed. It is a well settled rule that a prior art patent which supports equally well two conflicting theories is too indefinite to anticipate (Law Item No. 5, *post* p. 80).

Franklin's Apparatus, Even as Defendants Interpret It, Is Insufficient for Simmons' Purpose in Four Vital Respects.

However, even assuming that the packer so indefinitely referred to by Franklin meant, to a man skilled in the art, a packer on the flow pipe, still the apparatus disclosed

in Franklin's patent is not capable of carrying out Simmons' method and is insufficient to anticipate the apparatus claims of Simmons' patent.

To illustrate their understanding of the Franklin disclosure, with a packer mounted on the flow pipe in accordance with their contentions as to the knowledge of the prior art, defendants have taken Figure 4 of the Peckham Report (II, 440) and added the Franklin valve to it at the place illustrated in the modified Figure 4 printed opposite page 25 of their brief. It will be observed that Franklin's valve, as defendants have inserted it in the flow pipe of this dry-cased well of 1880, is now associated with a packer, yet the assembly still does not correspond to the Simmons tool. It falls short of Simmons' tool in four respects.

1. A test cannot be made in accordance with the Simmons invention unless the position of the packer on the pipe be such that when the inlet to the pipe is adjacent the formation to be tested the packer will engage the well at the point required to seal off the formation from the pressure of the drilling fluid. Since the function of the packer is to relieve the formation of the drilling fluid above it during the brief test period, and to reapply the pressure of the drilling fluid immediately thereafter, the packer must be set *close above the formation to be tested*. But in the drawing of the well of 1880 relied upon by defendants the pipe is broken away between the packer and the inlet at the bottom of the pipe to indicate that the packer is at some indeterminate but substantial distance up the well. This is appropriate to the purpose of the Franklin arrangement (if it is assumed, as defendants contend, that the packer referred to by Franklin is a water-packer on the flow pipe) since the function of the water-packer in this flowing well of 1880 is primarily to build up a gas pressure in the well upon the oil to force the oil up the flow pipe to the top of the well. For Franklin's purpose the proper position of the packer is *above the surface of the oil* as it rises in the well under its own natural pressure, regard-

less of the depth at which the oil formation is located and even though a very considerable length of flow pipe, different in different wells, must be let down into the oil below the packer.

2. To carry out the steps of Simmons' method the valve must be mounted *close above the inlet*. The object of the productivity test is not merely to ascertain the existence of oil or its quality but to determine the amount of oil which the formation tested is capable of producing and whether it contains oil in commercial quantities (I, 42 and 48). When the packer is seated and the valve opened the oil (and salt-water if there is any in the formation) will pour into the pipe. The valve is left open for a known period of time, ordinarily from 15 to 20 minutes, and the valve then closed and the pipe withdrawn. By the height to which the liquid has risen in the pipe and by its composition the amount of oil which the formation will produce can be determined (I, 41-2). It is evident that if the valve is positioned any substantial distance above the inlet which is adjacent the formation, the valve when closed will retain above it only a portion of the oil produced, the test will be deceptive and no accurate determination of the formation's productivity will be possible. In an extreme case, the oil might not rise above the valve at all, the pipe would be withdrawn and the operator misled into believing he had encountered a dry formation. In any case the sample would not afford a measure of the possible production of the stratum tested (patent 3/89-90).

Defendants, for the purpose of building up an apparent similarity to the Simmons testing tool, have in their drawing opposite page 25 of their brief placed the Franklin valve immediately above the packer, i. e. as close to the inlet as possible; but there is no disclosure of that relationship in the Franklin patent and nothing in the purpose of the Franklin patent that calls for it. Franklin asserts that his valve "can be connected with the tubing of the well, either within or without the well, but preferably within at

a point above the packer . . ." (1/15-16). Franklin thus contemplates locating his valve at any point between the top of the well and the packer. He does assert that his device may be placed "deep within the well" and thereby obtain considerable advantage" (1/48-50), but "deep within the well" does not imply "at the bottom of the well", nor does "at a point above the packer" mean "just above the packer". The Simmons combination would be useless if the valve were located any substantial distance above the inlet which it is to control, as it is in Franklin.

From the foregoing it will be seen that even when the prior art imported into the Franklin patent is interpreted most favorably to defendants, it merely discloses the three major elements of the Simmons tool and fails to disclose the spaced relationship of these parts which characterizes the Simmons tool; and is required for the purpose of Simmons' method.

That Judge Wilbur failed to note or to take into account this deficiency may, perhaps, have been due to his pre-occupation with the controversy between the parties as to whether it was proper to credit the Franklin disclosure with a packer mounted upon the flow pipe at all. In any case, he did overlook this deficiency of vital importance. It often happens that things of ancient date which have points of similarity with things of the present are assumed to be the same, the points of difference being obscured by distance; but upon closer scrutiny these points of difference are disclosed and the two things are seen to be quite unlike and by no means equivalent.

3. Another deficiency of the device disclosed in Franklin's patent that makes it unsuitable to carry out Simmons' method, and that differentiates it from the Simmons tool, is that in Franklin the valve is incapable of retaining and carrying to the surface an entrapped sample.

The Ninth Circuit Court of Appeals was, we believe, misled as to this by the fact that in the opening portion of the specification Franklin emphasizes that his device is capable

of "keeping the tubing closed while drawing it" (1/31-5), and the court assumed that this meant that he had a valve which would hold against leakage of any kind. But later in the specification it is made clear that his valve was preferably and intentionally made in the form of a check valve by giving a vertical play to the valve disk D. He says (2/13-15):

"Between the shoulder b^2 and the flange b' there is enough room to leave a very little play vertically to the parts lying between."

This play or vertical movement permitted in the part D is appropriate to the purpose of the Franklin patent; but it would defeat Simmons' purpose. Franklin did not want his apparatus, as it was withdrawn from the well, to lift oil out with it; he intentionally so designed his apparatus that this would not take place (I, 450-51, 456). As Franklin explains, the valve would keep the tubing closed against the upward flow of oil in the well while the flow pipe was being installed in the well and while it was being drawn,* because "when the device is closed the *pressure of gas* keeps [the disk D] seated on the part C above it, so there will be no leak" (2/19-21). It is only the upward pressure of the gas that keeps the tubing closed by the valve disk D when the upper section is "held in suspension" (2/17) as it must be when the flow pipe is being dropped down into the well or lifted out of it. But when, in drawing the flow pipe out of the well, it has been elevated to a point where the pressure of the fluid from below is no longer sufficient to hold up the weight of any fluid entrapped in the pipe, the disk D is free to drop downwardly and permit the escape of any such fluid, so that the apparatus will be withdrawn from the well empty.

That Franklin deliberately designed his apparatus so that the disk D would permit any oil in the pipe to escape back into the well is manifest from the drawings and speci-

*... so that it could be brought out empty and not flow on the workmen while it is being withdrawn" (Halliburton I, 450).

fication of the Franklin patent and is corroborated by the testimony of the witnesses for both parties. (See Halliburton I, 466; 472; 481-2, and defendants' witness Howard who said: "According to this drawing in this patent fluid could not pass into the chamber above the valve, but it appears from this drawing that it could pass into the chamber below"—I, 370.)

(4) A still further insufficiency of the Franklin apparatus for Simmons' purpose is that if used in a well containing drilling fluid the device is open to the pressure of the drilling fluid above the packer, and this pressure would be carried down through the valve casing to the formation below the packer. For this reason the device could not possibly function as a tester. The path of this leakage would be into the valve housing B' between it and the part C filling the chamber between them and then leaking around the flange c' and the disk D into the lower pipe section B, and this leakage would occur especially if the valve had been opened (Halliburton I, 451-52; 465; 468). Such possibility of leakage would be no detriment to Franklin's purpose since his well contained no drilling mud or other foreign fluid; but for Simmons' purpose of taking a sample from the formation relieved of the drilling fluid pressure such leakage down the pipe into the formation below the packer would be fatal. Defendants' witness Howard admitted that if there was any appreciable clearance in the valve, such as is provided in the Franklin patent, the pressure of the drilling fluid would be rapidly imposed on the formation below the packer upon the valve being opened (I, 372) and that if there was any appreciable amount of leakage the test would be destroyed (I, 372). This further insufficiency of the Franklin apparatus for Simmons' purpose was overlooked by Judge Wilbur.

Thus a close examination of the mechanical combination of parts disclosed in Franklin's patent, even when supplemented by the general knowledge of the art as interpreted most favorably to defendants by defendants' counsel, discloses that, contrary to the conclusion arrived at by Judge

Wilbur, the Franklin apparatus could not be used in carrying out Simmons' process. This additionally confirms, we submit, the correctness of the decision of the Ninth Circuit Court of Appeals that Simmons' method claims are not anticipated by Franklin and also discloses that the Franklin installation is not an anticipation of Simmons' combination claims.

**Franklin's Apparatus Does Not Anticipate Simmons'
Combination Claims 9-17 and 19**

From what has already been said, it is clear that in the Franklin patent there is no disclosure of the spaced relationship of the elements of the Simmons' testing tool, i. e., a packer so related to the inlet that it may seal off the formation to be tested from the hydraulic pressure of the mud-laden fluid standing within the well and a valve so positioned with respect to the packer and inlet that when closed it will entrap the entire flow of cognate fluids resulting from the natural pressure in the formation thus relieved from the pressure of the drilling fluid (*ante* pp. 32-4). This Judge Wilbur overlooked.

It also appears that as described in Franklin's patent his valve is deliberately so constructed that the disk D has freedom of movement to permit any oil in the pipe to escape back into the well, thereby making it incapable of carrying the entrapped sample to the surface for examination (*ante* pp. 34-6). Judge Wilbur in his opinion recognized this freedom of movement of the disk of Franklin's valve, and that it would permit the contents of the tube to escape as soon as the weight of the entrapped sample equals or exceeds the upward pressure of the gas (I, 529), but he put this deficiency aside, in his discussion of Simmons' apparatus claims 9 to 17 and 19, on the grounds (1) that "It is clear that no invention would be involved in tightening what otherwise would be a leaky valve"; (2) that while Franklin shows a valve disk having vertical play in his drawings and specifications, he "expressly

states that the lower disk may be secured to the lower part of the valve"; and (3) "Moreover, the Franklin device built tried and tested by the appellees recovered an entrapped sample" (I, 529-30).

No doubt, after Simmons' conception of the tool having a valve tight in both directions (which would not only shut out the upward pressure of the surrounding drilling fluid but would also hold the entrapped sample as the testing tool was lifted out of the drilling fluid) it was well within the ability of any competent mechanic to make for him such a tight valve; yet it is our submission that this is not enough to anticipate the Simmons apparatus claims 9-17 and 18.

It is to precisely such circumstances as these that this Court has repeatedly applied the rule that even slight changes, otherwise within the range of mechanical skill, are enough to give the changed apparatus the status of a patentable invention if the change was foreign to the earlier patentees' purpose and was dictated by the new purpose first disclosed in the patent in suit (Law Item No. 6, *post* pp. 81-2).

As to the statement that the lower disk may be secured to the lower part of the valve, found in the last paragraph of Franklin's patent (2/32-3), it is too obscure to constitute an anticipation, as we feel confident Judge Wilbur would have held if he had not misconstrued the importance of the fact that any competent mechanic knows how to tighten a leaky valve. As Mr. Halliburton pointed out, even though the disk D were attached solidly to the part B as Franklin suggests it would still leak, because at line 13 on page 2 Franklin says "Between the shoulder *b*² and the flange *b*¹ there is enough room to leave a very little play vertically to the parts lying between" (I, 469-70 and 488). There is no suggestion in the patent that this vertical play should be omitted if, as suggested at the end of the specification, the disk D is attached solidly to the part B. It is significant that in defendants' illustration facing page 28 of their brief, their definition of the "Alternate Form Described in Patent" violates Franklin's general

and unrestricted direction to provide room between shoulder b² and the flange b' "to leave a very little play vertically to the parts lying between" (II, 350, 1/13-15). The part lying between in the alternate form is the flange c' *but the defendants' drawing has eliminated the room for vertical play specified by the patentee.*

It is further significant that the Circuit Courts of Appeals are in disagreement as to the disclosure of Franklin in regard to his valve. The Ninth Circuit Court of Appeals has found that the alternative form of valve eliminating the floating disk was not intended to drain during withdrawal. The Court of Appeals of the Fifth Circuit, however, found the contrary, saying:

"We agree however that Franklin did not intend to get a sample from the well by raising the pipe, but intended to keep from getting a sample that way by making his valve a leaking one that would let the contents escape as the pipe is raised" (*Johnston Formation Testing Corp. v. Halliburton*, 88 F. (2d) 270, 272).

The lower courts also reached conflicting conclusions as to Franklin's disclosure on this matter (I, 21 and Finding 30, appendix, p. 98). These flat disagreements appear to us to be in themselves strong evidence that Franklin's disclosure is too nebulous to anticipate the Simmons combination claims.

As to Judge Wilbur's finding that the "Franklin device built tried and tested by the appellees recovered an entrapped sample", plaintiffs' submission is that the evidence in that regard, based wholly upon *ex parte* operations attended by no representative of plaintiffs, is utterly insufficient. It is well settled that such *ex parte* tests have little weight; that they are subject to grave suspicion and every doubt should be resolved against them (Law Item No. 7, *post* p. 82).

Defendants produced a valve structure, defendants' Exhibit K, said to have been made in accordance with the Franklin patent and said to have been used success-

fully in one water shut-off test. "It is not the purpose of a water shut-off test to test the productivity of the formation" (Howard, I, 368). Defendants' patent expert Abbett testified to one attempt made with this Exhibit K which succeeded only in lifting out of the well a column of 260 feet of the drilling fluid "that had leaked around the packer and come up into the pipe" (I, 256-61; 260). Mr. Paul J. Howard testified about the water shut-off test (I, 517-19). He testified that they succeeded in drawing from the well in the drill pipe 150 feet of fluid "The top 100 feet of fluid consisted of gas and the oil-cut mud, and the bottom 50 feet consisted of mostly—there might have been a trace of mud in it—but mostly of fluid. We could see that it was practically all oil and oil-sand" and "On the basis of that showing I approved the test of shut-off, as indicating that no water had access to the hole from above the point of cementing the casing in the hole" (I, 368). On cross examination he testified that the valve did not leak but "Looking at the drawing [of the Franklin patent], the device itself is very similar to this drawing. I wouldn't say that it is made exactly as this is made. There is a difference possibly . . . in the size of the opening . . . According to this drawing in this patent fluid could not pass into the chamber above the valve, but it appears from this drawing that it could pass into the chamber below" (I, 370). That the valve of Exhibit K does not conform to the drawing of the Franklin patent is manifest, therefore, from the fact that in valve on Exhibit K the fluid did not "pass into the chamber below" and so leak away.

Defendants emphasize (their brief p. 31) testimony of the plaintiff Halliburton that "if the Franklin device were equipped with a packer and used to test the formation in accordance with the patent in suit, it would infringe the latter"; and Judge Wilbur was so far impressed by this argument that he expressly relied upon it in reaching his conclusion as to the invalidity of the apparatus claims (Opinion I, 529). But reference to the record will show that the question and answer *were excluded by the trial*.

court and appear in the record only as evidence taken under the provisions of Equity Rule 46 (I, 491 and 210). Defendants took no steps to bring this excluded evidence properly before the Circuit Court of Appeals, and it seems clear that the exclusion of it by the trial court was correct. In any event the expression of Mr. Halliburton's opinion was conditioned by the words "If the Franklin device is so modified by the addition of a packer *and used in accordance with the teachings of the Simmons' patent*, I would say it was an infringement" (I, 491; emphasis ours).

Furthermore, as we have pointed out (*ante* p. 36), the Franklin valve housing, made up of the castings B' and C, is so constructed that it could not be used for Simmons' purpose. For such use as Simmons conceived the valve casing would have to be tight against the inflow of the drilling mud that fills a rotary-driven well. Any competent mechanic could, no doubt, supply a tight valve casing when called upon to do so; but for Franklin's purpose there was no need for a tight casing. That need arose only after Simmons' conception of his new tool for testing rotary-driven wells without removing the drilling mud.

It thus appears that for these several reasons Franklin's apparatus could not be adapted to Simmons' process without significant changes foreign to Franklin's purpose but dictated by the new purpose which Simmons had conceived. On this state of facts it is clear, we submit, that the Ninth Circuit Court of Appeals erred in holding Simmons' apparatus claims invalid on the ground that "no invention would be involved in tightening what otherwise would be a leaky valve". That court further erred, we submit, in disregarding the spaced relationship of the elements of the Simmons combination, and in giving significant weight to the testimony as to the *ex parte* tests of the reconstructed Franklin valve, and in attaching importance to that portion of Mr. Halliburton's testimony that was excluded at the trial.

Because of these errors of law and fact in the decision of the Ninth Circuit Court of Appeals that the Simmons

combination claims 9 to 17 and 19 are anticipated by the disclosure of Franklin's patent, this Court should, we submit, reverse that decision and hold the combination claims valid.

**The Unsuccessful Two-String Testers for Rotary Drilling
Proposed by Cox and Edwards (Defendants' Assignments of Error Numbered 2 and 3)**

Defendants bring to the attention of the Court the Cox patent 1,347,534 (application filed June 24, 1920) and the Edwards patent 1,514,585 (application filed January 17, 1921) in connection with their assignments of error numbered 2 and 3 (their brief p. 8). The asserted defense is that the method claims lack invention over the Franklin patent in view of the prior art; that they describe at most the use of the Franklin device in the manner proposed by Cox and Edwards (see defendants' brief pp. 8, 20 and 47).

Plaintiffs, on the other hand, rely upon the Cox and Edwards patents as *evidence that what Simmons did was invention*. These two patents show that men of inventive ingenuity skilled in the art, who are presumed as much as Simmons is to have had knowledge of Franklin's patent, approached the problem of testing a well drilled by the rotary method with the knowledge born of experience in rotary drilling that circulation of the drilling fluid could not be interrupted without grave danger of cave-ins above the packer and "freezing" of the drill stem in the well hole; and that because of that knowledge they believed that circulation of the drilling fluid had to be maintained. This belief that circulation was an indispensable step in the testing procedure constrained them to provide two strings of pipe, an outer string to maintain the circulation of the drilling fluid and an inner string to make the test. The result was that the testing procedure and apparatus they proposed was never used. The problem remained unsolved.

It is plaintiffs' submission that on the question of the inventive character of Simmons' work, these patents, so far from showing lack of invention, are the final and conclusive proof that Simmons' solution of the problem lay beyond the capacity of the men skilled in the art. They constitute that concrete evidence of invention which has always been recognized by this Court in the unsuccessful attempts of others to produce the same result. (Law Item No. 2, *post* pp. 77-9).

*The Disclosure of the
Cox patent 1347534.*

In purpose and procedure the disclosure of the Cox patent approaches more nearly to Simmons' invention than anything else in the prior art. It is, indeed, the only disclosure of the prior art that proposes a testing device that will shut off the pressure of the drilling mud from the formation to be tested and then take a sample of any kind and bring it to the surface.

But by 1920 the hollow drill pipe had been dedicated to the supposedly indispensable function of a conduit for the circulating drilling mud, and Cox had no thought of dispensing with this circulation or of using the drill string as the sample chamber. Instead he proposed to assemble and run into the well, inside of the drill stem and concentric therewith, a second string of metallic hose to serve as a sample receptacle. Moreover the Cox arrangement did not provide for an uncontaminated sample. It used a check valve which permitted the drilling fluid to rush into the metallic hose as soon as the packer was lifted (I. 699).

The Cox patent (II. 367) discloses a testing apparatus for testing oil wells drilled by the rotary system "in order to ascertain if oil, water, gas and other liquids are under the path of the drill or in proximity thereto, that is the stratum

which has not been disturbed or only partially disturbed by the drill bit" (1/9-18). To this end the patentee provides "means for procuring and bringing to the surface a small quantity or sampling test of such oil, sand, water or whatever is in the path of the drill bit for inspection and analysis" (1/18-22). The testing head 3 threaded on to the lower end of the drill stem 1 is provided, as is usual in rotary drilling, with exit orifices 4 "to provide a passage for water, slush, etc., when the drill stem is lowered into the well" (1/63-4) whereby the usual continuous circulation of the drilling fluid to prevent the caving-in of the well is maintained (Abbett I, 317-9; 267 and Halliburton I, 490). The apparatus "for procuring and bringing to the surface a small quantity or sampling test of such oil, sand, water or whatever is in the path of the drill bit" comprises a second string of flexible metallic hose 13 within and concentric with the drill string, having its lower end screwed into the upper end of the body 6 of the testing head. The string of flexible metallic hose is thus in communication with a central bore in a nipple 9 extending downwardly from the body 6 which nipple carries at its lower end "a sharp pointed plunger 7 for piercing the formation at the bottom of the hole" (1/70-3). And this sharp-pointed plunger is perforated "so that liquid, gas, etc., may enter" (1/73-4). The nipple 9 is surrounded by a rubber nose 10. In operation "the drill stem carrying the device is lowered into the hole to within a short distance of the bottom where it is then dropped at sufficient speed to cause the nose 10 to forcibly strike the bottom of the hole. On such impact the sharp-pointed member 7 is forced downward and on breaking the closure 13a is plunged into the bottom of the hole. The impact of the heavy drill stem will also cause the rubber nose 10 to be forced against the walls of the well and effectually shut off the water and slush in the hole from the opening 14" (1/89-101) into the string of flexible metallic hose. Thereupon the desired small quantity or sampling test of the oil,

sand, water or other material in the path of the drill, passes through the perforations into the hollow interior of the sharp-pointed plunger "and flows upward and is held in the flexible hose 13 by a check valve 15 of any suitable construction. The drill stem may then be removed from the hole for inspection of the test" (1/104-8).

How the metal hose 13 proposed by Cox could be assembled within the pipe 1 as the testing device was let down into a deep well (which might be 5,000 to 10,000 feet deep) is not disclosed; but it is clear that this work of double assembly, however managed, would greatly delay the operation of getting the testing head down to the bottom of a deep well. There is no evidence to show or reason to believe that Cox's double-string tester could be assembled and gotten into the well within that relatively short period of time for which it is permissible, in rotary drilling, to interrupt the circulation of the drilling fluid. It was Simmons' departure, by a bold step, from the two-string arrangement of Cox that made possible Simmons' use of the test string as the carrier for his testing head and as the receptacle for the test sample. This important advantage has been adopted in defendants' accused tool.

The "check valve . . . of any suitable construction" of the Cox patent, although capable of entrapping a sample is not capable of excluding the drilling fluid from the sample chamber as the drill stem is withdrawn. Consequently the drilling mud, during the withdrawal of the test string from the well hole, will rush into the metallic hose or sample receptacle containing the small sample captured when the plunger 7 pierces the formation at the bottom of the hole. Defendants' expert Abbett admits this (I, 312-314) and he agrees that this is a disadvantage as compared with a tester (such as Simmons') having a valve which will exclude the drilling fluid while the test string is being removed from the well; that a valve which will exclude the drilling fluid has the advantage "that the

quantity of material within the string will be identified as having completely entered the test string before the packer was raised from its seat" (I, 314). As Mr. Halliburton put it, the operator "never would know how much of the fluid within the tube came from the formation and how much was the mud fluid" (I, 459, f. 644, and see the testimony of defendants' witness Dear I, 398).

It is therefore apparent from a close examination of the Cox patent, and from what defendants are obliged to admit about it, that whatever Cox's purpose might have been, his apparatus was not capable of "complete separation of the water, mud, slush, etc., in the hole above the point from which the test is to be taken from the quantity to be investigated and analyzed" (1/23-7). The separation intended to be effected by the rubber nose 10 at the instant of stabbing the bottom of the hole, could not be maintained as the test string was withdrawn from the well. Indeed, the more carefully one reads the Cox patent the more his device appears to be incapable of doing any more, in the way of testing, than could be done by the old "sand pumps" by which scrapings mixed with the drilling fluid were taken from the bottom of a drill hole, without setting a packer to seal off the drilling fluid (see Carll patent 73,577 of 1868, II, 333; Carll Report of 1877, II, 412 and I, 237), except that Cox's stabbing device penetrated and so explored the stratum ahead of the drill "which has not been disturbed or only partially disturbed by the drill bit" (1/16-8). He proposed to make a "sampling test" not only of the oil and water but also of the sand "or whatever is in the path of the drill bit", and it was to test the stratum ahead of the drilling that he provided the sharp-pointed plunger 7 "for piercing the formation at the bottom of the hole" (see Abbett I, 316; Halliburton 499). At any rate, whatever his purpose may have been, it is admitted that Cox did not have a device such that the quantity of material within the test string could be identified as having completely entered the test string before the packer was raised from its seat. Without such a sub-

stantially uncontaminated sample it is impossible, as Mr. Halliburton pointed out (I, 459), to measure the possible production from the formation tested.

It is clear, therefore, that Cox, although he had some elements of Simmons' idea, lacked the two primary features that gave success to Simmons; (1) the making of the test with a single string of pipe without maintaining the circulation of the drilling fluid, and (2) the taking of an entrapped and substantially uncontaminated sample that would give a measure of the productivity of the formation tested.

The Cox proposal was a complete failure. Although petitioners had their expert, Mr. Abbett, conduct a search to determine whether the Cox device was ever successfully used, they were unable to produce any proof that it was (I, 319), and they did not offer any proof that it was ever used at all.

Because the Cox tester lacked the two primary features of the Simmons tester, and because failure never anticipates success, the Cox disclosure is not an anticipation of either the method claims or the apparatus claims of the Simmons patent (see Law Item No. 8, *post* p. 82).

But defendants suggest (their brief, pp. 47 and 52) that when the Cox patent (or the Edwards patent) is taken together with Franklin's patent they show a state of the art from which Simmons' method and apparatus could be extracted without invention; i. e., by the exercise of the expected skill of well-drillers. There is, however, no evidence in the record that tends in the slightest degree to show that this was within the reach of the man skilled in the art. On the contrary, as we have already pointed out, the failure of Cox and Edwards, because of the complications and insufficiencies of their proposed-testing apparatus, is convincing evidence that Simmons' simpler solution was not within the reach of well-drillers; and that evidence is further supported by the fact that the want which they tried to fulfill had existed unsatisfied for many years and

upon the advent of Simmons' invention it was completely satisfied by the universal adoption of his proposals. (See Law Item No. 2, *post* pp. 77-9).

Defendants in their argument finally assert (defts' brief pp. 49 and 52) that the Simmons process "is the same old process used by Cox," etc. But this evidently is not so. It is clear from the disclosure of Cox's patent that, as Judge Wilbur found, Cox rejected the idea of testing a well without circulation of the drilling fluid and consequently did not discover that the use of a single string of pipe for taking an entrapped sample was possible and practical (Opinion of Judge Wilbur I, 525-6). He did not disclose "what had not been thought possible in the art, i. e., that such a device could be set in a well containing drilling fluid while there was no circulation thereof long enough to make a test" or discover "that a well could be safely tested by the lowering of a single string of pipe equipped with a valve packer and strainer and that it was not necessary to * * * provide an extra string of pipe for the circulation of the drilling fluid" (Opinion, I, 531).

Edwards patent 1,514,585.

The Edwards patent discloses a two-string tester much like Cox's in general form and attached similarly to the drill stem, with a small pipe substituted for the metal hose of Cox. His disclosure is in the nature of a proposed improvement on the Cox device.* Edwards abandoned the idea of recovering an entrapped sample. As in Cox, the ordinary drill stem is used in the ordinary way to circulate the drilling fluid. The "water or slush is forced into the interior of the pipe by means of the ordinary slush pump commonly used for the purpose" (1/36-9). A packer of a more usual construction is substituted

*See *Edwards v. Johnston etc. Corp.*, C. C. A. 5, 56 F. (2d) 49-50.

for Cox's unusual "rubber nose" (1/40-7). The second string of pipe within the drill pipe and by which the test is made is not assembled simultaneously with the assembling of the drill pipe as that pipe is run into the well, as in Cox. With the Edwards apparatus "When it is desired to make a test, the drill pipe with the nipple 4 and the perforated lower end attached to the packer is lowered to near the bottom of the well" (1/65-9) and only after that has been done is the test stem 8 inserted. This permits a washing water to be forced down the drill pipe in the space around the test stem 8 pushing the drilling mud ahead of it and "thoroughly washing the stratum to be tested", before the packer is set to isolate the stratum that is to be tested, and also permits the immediate setting up and the maintenance of the circulation of the drilling mud within the well after the packer is set (1/70-83). "After a time so as to let the water settle away and oil, gas or other fluid to accumulate" in the drilled well below the packer the lower end of the test stem 8 as shown in Fig. 7 is unscrewed from the sleeve 7 and the test stem is lowered. "If there be any pressure of oil, gas or other fluid it will now rush through the perforated section of the stem 8 and up the stem and if there be sufficient pressure of the oil, gas or other fluid from the stratum below the packer, it will push a stream of the same from the top of said stem" but "... if the pressure of the oil, or other fluid should not be great" an ordinary pump is inserted "at any suitable point in the test stem 8" whereupon the pump "can be started and the fluid forced out through the stem 8 thus completely testing the stratum under investigation, both as to quality and quantity of flow of the fluid," (1/83-105).

There is no suggestion of entrapping a sample in the test stem or of withdrawing the stem with an entrapped sample. As said by the Board of Appeals in the patent office in distinguishing the Edwards patent from the Simmons' invention "The patent does not describe such operation of closing the valve and raising the pipe to remove

the entrapped sample" (II, 150). Defendants' expert concedes that "the whole disclosure" of Edwards "as far as description goes" was the idea of flowing the oil, gas, etc., out of the well through the tube (I, 324) either under its own pressure if that pressure is sufficient or, if not, then by pumping. The requirement that a pump should be used renders the Edwards patent totally impracticable for Simmons' purpose. Well pumps are not present at drilling wells and it would cost in the neighborhood of \$2,500. to install such a pump for the purpose of making a test, as compared with a total charge of less than \$300. for making a test with the Simmons' invention (I, 325).

Nor is the apparatus described in the Edwards patent *capable of* recovering an entrapped sample. After the lower end of the pipe 8 has once been unscrewed to let it down and expose the perforations in the lower portion of the pipe, it cannot be screwed up again to entrap a sample (I, 457) because it would not be possible to screw the end of pipe 8 back into the screw-threaded lower end of loose sleeve 7. which has nothing to hold it still (I, 547, Abbett. 329-32).

In requiring the use of two strings and in failing to recover an entrapped sample, it is clear that the Edwards patent fails to disclose the essential features of the Simmons invention. As said by Judge Bryant before whom Edwards appeared and testified at the trial of the Texas case ". . . Edwards did not have in mind and did not disclose, and never did disclose, any such device as this man Simmons had." (Exh. 5, Texas, I, 803).

The Cox and Edwards patents emphasize the recognition of the problem and the difficulty of its solution, and prove that Simmons' solution was inventive.

These patents, apart from all the other evidence in the case, show that at least five years before the advent of Simmons' invention the need existed for a way to test the productivity of formations encountered during the rotary drilling of wells, without the necessity of per-

manently setting or cementing a string of casing, and those skilled in the oil drilling art recognized it as a problem to be overcome. The Cox and Edwards patents show unsuccessful attempts to solve that problem. Because the well might cave in and prevent the removal of the drilling apparatus, these prior inventors deemed it necessary to employ two strings of pipe and maintain circulation of the drilling fluid during the taking of a test, and neither of them discovered or conceived of any way of avoiding this. A two-string tester has never succeeded. The time required for running two strings into a well is prohibitive, as is also the time required for pumping out the oil, etc., from the formation undergoing test, as proposed by the later of the two, the Edwards patent. The art found it better to continue with the setting and cementing of casings rather than to make any use of the Cox or Edwards proposals. The uncontradicted testimony of respondent Halliburton establishes that the two-string testers have never succeeded and are nowhere in use today (I, 456-7).

By contrast with the Simmons patent, the Cox and Edwards patents show what was new and first discovered by Simmons. Neither the Cox patent nor the Edwards patent discloses the primary features responsible for the success of the Simmons invention. Both describe two-string testers and neither discloses the recovery of an entrapped and uncontaminated sample capable of measuring the productivity of a formation encountered in the drilling of a well.

This showing is very much emphasized, we submit, by the fact (see *post* pp. 57, 59 and 60-1) that both Edwards and Cox filed in the patent office, during the pendency of the Simmons patent application, interfering applications of their own of later date than Simmons' application (and, of course of much later date than their two-string tester patents which have been discussed) and in these later applications they disclosed single-string testers and made Simmons' claims, but were defeated in the patent office interferences (see Law Item No. 4, *post* p. 80).

*Other Well Testers of the Prior Art
Further Emphasize the Novelty
of Simmons' Innovation.*

The other patents and publications relating to the testing of formations encountered in the drilling of water wells and oil wells further emphasize the novelty of Simmons' invention. They all propose to remove the fluids from the stratum to be tested by flowing, pumping or bailing. No one of them proposes to test the formation by withdrawing an entrapped sample of the cognate fluids.

The Lyons patent 46,124 of 1865 (II, 318) shows an arrangement for testing oil wells in which, in case the formation tested will not discharge through the flow pipe under its own pressure, the fluid in the formation is driven to the surface "by forcing down a strong current of air" (patent p. 1, top of column 2; Abbett I, 230-31; and Defts' brief p. 26). It does not disclose the recovery of an entrapped sample (Abbett I, 349).

The Burr & Wakelee patent 68,350 of 1867 (II, 330, Abbett I, 235) shows an arrangement in which the fluid is drawn from the formation to be tested by pumping. That is the only way the patentees describe of getting any fluid out of the well (Abbett I, 350). Mr. Abbett agreed when questioned by the court that this was a material difference (I, 354).

Defendants' expert Abbett agrees that none of the publications of 1877 to 1885 Exhibits I-1 to I-3 describe the recovery of an entrapped sample, as distinguished from the recovery of cuttings etc. by a sand pump (I, 364 and see *ante* p. 46). The Carll Report of 1877 says (II, 421-2): "Thousands of dollars have been spent in testing hopelessly unproductive wells that were drilled 'wet', because it could not be known until they were tubed and tested, whether they contained oil or not." The Chamberlain Report published in 1885, discussing artesian water well drilling discloses a seed-bag or rubber packer on a flow pipe to test the capabilities of a formation to "yield

a flow at the surface when put under proper control" (II, 159-62; Abbett I, 228-30). Such a test is possible only when there is "sufficient pressure in the formation tested to cause the fluid to flow to the surface" (defts' brief p. 19).

Cooper's patent 1,000,583 of 1911 (II, 361) shows a very complicated arrangement by which "a well can be tested for the presence of oil or gas, by pumping" (II, 362, lines 117-18 and Abbett I, 263) or by bailing (Abbett I, 337).

Macready's patent 1,522,197 of 1925 (II, 393) shows a method of testing rotary driven wells containing the drilling fluid, in which the circulation of the drilling fluid is maintained by use of a double string as in Cox and Edwards, and fluid is removed from the formation to be tested by bailing (II, 394, line 70).

The Wide Industrial Use of the Simmons Invention

The Simmons invention has been universally adopted in substitution for the earlier practice of setting and cementing a string of casing. This is established by uncontradicted evidence.

A few days after filing his application for patent, Simmons demonstrated his invention in the lobby of the Garrett Hotel in El Dorado, Arkansas (L. 419). Word reached ~~Simmons~~ ^{from Hall} Halliburton in Oklahoma concerning this and he went to Arkansas, met Simmons, who demonstrated the tester to him, and on February 17, 1926 Halliburton entered into an agreement with Simmons for the rights to the invention (I, 34, f. 54; 45).

Initial Apprehensions of Well Owners

Simmons took his original device to Halliburton's headquarters at Duncan, Oklahoma, and Halliburton endeavored to get some well owner to let them operate the invention in a well. Simmons' proposal ran so far contrary to the knowledge and beliefs of well drillers that plaintiff Halliburton had difficulty in getting permission to run a test in any one's well because "no one thought that you could

leave the device in a well without circulating and not have it stick" (I. 45-6). An opportunity to demonstrate the invention was made possible only by respondent Halliburton personally guaranteeing the operator against loss or injury to the well, even to the extent of drilling a new well if necessary (I. 46). This emphasizes the novelty and inventive character of Simmons' work (Law Item No. 3, *post* p. 80).

Successful Demonstrations Under Halliburton's Guaranty

Contrary to the statement appearing in petitioners' brief (p. 14) the operation of the invention, employing the original Simmons device, was entirely successful from the beginning. The first demonstrations were made with the original Simmons device* upon three wells in Oklahoma belonging to Pace. Each demonstration was successful. The results of the first and third jobs were positive, showing the presence of gas in the formation tested. The result of the second job was negative, showing the absence of oil or gas (I. 420-1). Defendants' counsel assert in their brief (pp. 9 and 14) that the Simmons device was "a failure" and was "never commercially used"; but it is not denied that these demonstrations with the original tool led to its wide adoption, accompanied by improvements in structural detail. That the original device was inoperative cannot be asserted by defendants or their witnesses (see Gess I. 394-5 and Dear. 406). Mr. Simmons testified: "I did do it and I can do it again" (I. 427, f. 600).

General Adoption

Having demonstrated the success of the invention with the original tool, the construction of testers for general use

*The first original Simmons tester, corresponding exactly to the drawings of the patent in suit, was offered in evidence in this case as plaintiffs' Exhibit 9. A model corresponding thereto is plaintiffs' Exhibit 10.

was immediately undertaken. An improved form of valve with a stop-cock and gear was substituted for the original valve. The invention was then put into general use throughout the mid-continent oil fields and was introduced in California late in 1930 or early in 1931 (I, 115). Since 1927 the invention with this stop cock type of valve has been generally used throughout the oil industry (I, 63-4). Prior to the trial of this suit in the Fall of 1935 over 7500 wells had been tested with it (I, 63). In January or February, 1934 another form of valve, known as the "J" tool, was developed and put into concurrent use.*

The great value of the patented invention cannot be disputed. Once it had been established that a well could be tested with a single string of pipe without maintaining the circulation of the drilling fluid and with the recovery of an unimpaired sample from which the productivity of a formation encountered in drilling a well by the rotary method could be determined, the earlier method of testing rotary driven wells was discarded (Halliburton I, 63-4). Mr. Halliburton's testimony to this effect was nowhere denied. It is confirmed by defendants' witness O'Neill, secretary and treasurer of defendant Johnston Oil Field Service Corporation, in his statement of his qualifications to testify as an expert oil operator (I, 155); by the testimony on cross examination of defendants' witness Heitmeyer that up to 1930 the Standard Oil Company of California

*We take exception to the statements at page 15 of petitioners' brief that "It is the 'J-Slot' form of testing tool, devised by Halliburton and not by Simmons, which attained some measure of success." The evidence is that the new testing method was practiced commercially with the stop cock and gear valve in the testing tool to the extent of approximately 3,000 tests in the years 1926 to 1933 inclusive (I, 61-2). The "J" tool device was developed in 1934 but of the 5,217 tests made from January 1, 1934 to the end of September, 1935 "Nearly all of those tests were made with the stop cock type device. A few of them were made with the 'J' tool device" (I, 63).

tested their wells by the old method of setting a casing and removing the drilling fluid from the well, with the resultant wasted expense and detriment to the well, but now uses the single-string formation tester instead (I, 375-6); and by the finding of Judge Bryant in the Texas case, that plaintiffs have developed a large business in this and foreign countries and its method and apparatus for testing formations in wells have "come into universal use and have become the standard apparatus and methods employed in testing the formations encountered in the drilling of oil wells throughout the oil-producing fields of the United States" (Finding 9, appendix *post* p. 92).

Judge Wilbur did not find it necessary to rely upon the commercial success of the Simmons testing procedure to sustain the patented method. His finding that Simmons' method was not anticipated by Franklin's patent for the reasons set forth in his opinion (I, 530-32), left no room for doubt that Simmons' innovation was invention.

If there were any doubt on this question of invention, the universal adoption by the industry of Simmons' method of testing would be sufficient to resolve that doubt (Law Item No. 2, *post* pp. 77-9). Such persuasive effect of the widespread success of the Simmons invention is not to be denied, as urged by defendants, because of the fact that immediately following successful demonstration with the original testing tool plaintiffs undertook the development of testers containing improvements in the form of the valve (Law Item No. 9, *post* pp. 82-3). The evidence clearly establishes that both the stop-cock and gear device (I, 53-4) and the "J" tool (I, 56-8) are used to perform the same series of method steps that characterize Simmons' method of testing, and that they differ from the testing tool disclosed in the Simmons patent only in the form of the valve, without affecting the substance of the device or destroying its identity with the Simmons invention.

*The Effort of Edwards to
Appropriate the Simmons Invention.*

The two-string tester of Edwards' patent 1,514,585 was a complete failure (I, 456-7). Upon observing the widespread adoption and commercial success of the Simmons single string tester Edwards undertook to appropriate it.

He first attempted this by claiming that the single string tester infringed his patent 1,514,585. The Simmons method of testing was introduced in Arkansas by plaintiff Halliburton in 1926. The Johnston Oil Field Service Corporation of Arkansas brought out in 1927 the Johnston tester (here involved) to compete with the Simmons tester. Edwards brought to trial in the Southern District of Texas before Judge Hutcheson in 1930 (44 F. (2d) 607) a suit against Johnston Formation Testing Corporation claiming that the use of the single-string Johnston tester infringed his two-string tester patent 1,514,585.

Both parties to that suit had knowledge of the Simmons application for patent then pending in the patent office. Johnston* had filed an application for a patent on defendants' single-string tester which application had been put into interference in the patent office, on October 5, 1927, with the Simmons application and other applications (II, 91-4). Edwards had filed an application for patent on the single-string tester and on January 30, 1930 this application had been put into interference in the patent office with the pending Simmons application (II, 113-20). This patent office situation including the fact that Simmons had filed his application for patent at an

*Edgar Clinton Johnston, patentee of the single-string tester used by defendants in this suit and also in the suit by these plaintiffs against Johnston Formation Testing Corporation in the Fifth Circuit, of which the patentee Johnston is president (I, 415). See patent 1,709,940, application filed March 23, 1927, Serial No. 177,719 (II, 461).

earlier date than either the Johnston or the Edwards applications on single-string testers, was not revealed to Judge Hutcheson by either party at the trial of the Edwards suit against Johnston's company.* The case was decided by Judge Hutcheson without any knowledge of the Simmons invention or of its important contribution to the industry. When the case reached the Circuit Court of Appeals for the Fifth Circuit, that court likewise had no knowledge of the Simmons invention. Both courts held, nevertheless, that the Edwards patent 1,514,585 does not cover the single-string tester, thus defeating Edwards' attempt to appropriate the Simmons invention to himself under his two string-tester patent.**

On March 8, 1932 Edwards made a final attempt to enlarge his patent by filing a disclaimer in which he disclaimed any device not "capable of closing the test stem to the entrance of fluid from the bore beneath the packer by motion of the stem while the packer is set." (II, 390). By this means Edwards sought to appropriate the step of entrapping a quantitative sample which is fundamental in

*Edwards v. Johnston etc. Corp. 44 F. (2d) 607, affirmed C. A. 5, 56 F. (2d) 49.

**Although this false light in which the single-string tester was first presented to the courts of the Fifth Circuit did not so far deceive those courts as to give Edwards success in his attempt to appropriate the Simmons invention, yet it should be noted that it was in this false light that the Fifth Circuit Court of Appeals first saw the single-string tester and was first asked to bring it within a patent monopoly. It is apparent from the opinion of Judge Cosgrave in the instant case (I, 21, 22) and from the opinion of the Fifth Circuit Court of Appeals in the suit on the Simmons patent (88 F. (2d) 270) that the conclusions reached and expressed by the Fifth Circuit Court of Appeals in that false light were prejudicial to these plaintiffs in the judicial consideration of the Franklin patent and its relation to the single-string tester described and claimed in the Simmons patent now at the bar of this Court (see ante p. 4, and remarks of court and counsel in the Texas case, Exh. 5, Texas I, 804-5).

the Simmons invention. Of course, this could not be accomplished by a disclaimer under the patent laws.*

After the unsuccessful outcome of his attempt to monopolize the Simmons invention under the Edwards two-string tester patent, Edwards continued to prosecute the interference of his later single-string tester application with Simmons in the patent office, asserting that he had conceived the invention as early as 1917 and that after some discouragement from one George Watkins "who pointed out the danger of the device becoming stuck in the well" (Exh. 5, Texas I, 155) he had disclosed the invention to Simmons in 1920. But on May 16, 1933 the patent office Board of Appeals decided the interference in Simmons' favor and awarded priority of invention to him (II, 153-69 and 170-6).

Finally when the suit for infringement of the Simmons patent came on for trial before Judge Bryant in 1935, Edwards appeared as a witness and attempted to assert that he and not Simmons was the inventor of the single-string tester, and that he had disclosed it to Simmons. Judge Bryant came to the same conclusion as the patent office, finding that the invention had not been communicated to Simmons by Edwards (see Finding 39, Appendix, *post* p. 102). At the end of the Texas trial Judge Bryant said:

"* * * I think that the credible testimony, the record testimony, the record that was made of the transaction at the time, all this documentary evidence shows conclusively that this man Simmons was the inventor of that tester.

"I do not think that there is any importance at all attached to his conversation with Edwards, whether he did or did not have it with him, because I consider that if he did have it with him, that Edwards did not have in mind and did not disclose, and never did disclose, any such device as this man Simmons had." (Exh. 5, Texas I, 803).

*Altoona Publix Trusts v. American Tri-Ergon Corp., 294 U. S. 477, 55 S. Ct. 455.

At the trial on the Simmons patent before Judge Bryant in the Fifth Circuit the defendants E. C. Johnston and Johnston Formation Testing Corp. attempted to prove invention prior to Simmons by one Philp or his associate Carter. Defendants here in their brief (p. 17) refer to the comments of the Fifth Circuit Court of Appeals on this evidence and direct this Court's attention to it. Judge Bryant, who heard and saw the numerous witnesses who gave this testimony, at the conclusion of the case said: "I think everything in the testimony conclusively points to but one fact, and that is that this man Simmons conceived this idea, developed the idea and worked on it in conjunction with Henderson, and all the parties who made any claim of interest in it had actual knowledge of every step in the development and exhibition of the tool, the sale to Halliburton, the fact that Simmons returned to Eldorado and no claim was made by Carter during all the time he was there in business, when he is bound to have known Simmons sold the title to this patent. I have got my mind very firmly convinced that those are the facts." (Exh. 5, Texas I, 803).

The evidence was not offered by defendants in this case. It is apparent from Judge Sibley's opinion in the Fifth Circuit Court of Appeals, that in the use he made of this evidence there was a serious misapprehension of the law. The law requires that such a defense be established beyond a reasonable doubt (Law Item No. 10, *post* p. 83). Judge Sibley could not so find, being unwilling to go further than to hold that "the evidence is not clear" and leaves the matter in "grave doubt". Defendants can gain no advantage in this Court by referring to a defense found to be without merit in fact (by Judge Bryant), decided to be insufficiently proven (by the Fifth Circuit Court of Appeals) and abandoned (by defendants here) before the trial of this case.

Not only Edwards and Johnston, but also Cox, filed in the patent office a patent application disclosing a single-

string tester and claiming the Simmons invention. The Cox application was filed on February 4, 1927, the Johnston application on March 23, 1927 (II, 208) and the Edwards application on August 24, 1928 (II, 146). The other applications were all filed after the Johnston application in the year 1927 (II, 205-8); and there is evidence to show that all this activity was occasioned by the introduction of the Simmons invention by Halliburton in 1926 (I, 64, 65, 66-7).

Infringement

The infringement complained of is the manufacture and use by defendant M. O. Johnston Oil Field Service Corporation, and the use by defendant Honolulu Oil Corporation, Ltd. (complaint, par. 8, I, 5-6), of the accused testing method and testing tool described in defendants' interrogatory answers (I, 68-85; and see Halliburton I, 85-8 and drawings Exhs. 16-B, C and D, II, 225-7).

The Method Claims.

The Ninth Circuit Court of Appeals held the method claims 8 and 18 infringed for the reasons set forth by Judge Wilbur in his opinion (I, 532). Judge Bryant in the fifth circuit had held them valid and infringed (see Findings 24-5 and 28, appendix, *post* pp. 97-8). The Fifth Circuit Court of Appeals in reversing Judge Bryant as to their validity did not comment upon his findings as to infringement. No question of infringement of these claims if valid was brought forward in defendants' petition for certiorari, and under the rule applied in *General etc. Corp. v. Western etc. Co.*, 304 U. S. 175, 177-8 the question is not brought-up by the writ.

Judge Wilbur's reasons for holding the method claims infringed (I, 532) leave no room for doubt.

As described in defendants' interrogatory answers, the apparatus illustrated in Exhibit 16-B (II, 225) is assem-

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bled with the packer in Fig. 3 screwed onto the bottom of the tester in Fig. 1. The method practiced by the defendants with this apparatus is as follows (see interrogatory answers, I, 84-5): The drill pipe 5, carrying the tester, is lowered down the well through the drilling fluid with the main valve 41 closed. When the apparatus has reached the bottom of the hole the packer is forced tightly into its seat to shut off the well below the packer from the pressure of the drilling fluid contained in the well above the packer. By lowering the drill pipe sufficient weight is imposed to open the main valve 41 permitting fluid to flow through the main valve and into the drill pipe 5. At the conclusion of the test, the drill pipe is lifted, drawing the main valve to a closed position followed by lifting the packer from its seat. The drill pipe carrying the tester and packer and containing the entrapped sample is then withdrawn from the well. The successive steps are identically the same as in the Simmons method (Halliburton I, 86-7 and Judge Wilbur's Opinion I, 532). The arguments in defendants' brief to the contrary (pp. 54-61) are contradicted by their answers to the interrogatories (I, 84-5). Infringement of the method claims by this series of steps is independent of any difference in the structural form of the apparatus used (Law Item No. 11, *post* p. 83).

The Apparatus Claims:

It is our submission that the apparatus claims 9 to 17 and 19 are also clearly infringed, since the defendants' accused testing tool is in every way the equivalent of the Simmons testing tool, differing therefrom only in the detailed structure of the valve and the mechanical means for opening and closing it.

Judge Bryant in the Texas case held these apparatus claims infringed by the Johnston tester employed by defendants in this case (Findings 14-23 and 27, Appendix, *post* pp. 93-7 and 98).

Defendants' contentions that the claims are not infringed are predicated upon the assertion that in view of the prior art "Simmons was not a pioneer inventor, nor indeed any other kind of an inventor" and that "if the Simmons patent is valid at all, it is merely an improvement, for which reason the claims should receive a narrow construction, and the patent limited to the precise device therein described" (their brief p. 55). If the claims are upheld on the grounds which we have set forth, and in accordance with the scope intended for them by the patent office, they are clearly infringed.

The identity that constitutes infringement in this case may conveniently be set forth by comparing defendants' accused testing tool with claim 15 of the Simmons patent, for example. The first element in claim 15 is:

"a single empty string of pipe to be lowered into the well through the drilling fluid to adjacent the formation to be tested".

This is the pipe 5 on the drawing in Plaintiffs' Exhibit 16-B. Only one string of pipe is employed in appellees' tester.

The second element called for by claim 15 is:

"a packer lowered into the well by said string of pipe for sealing off the drilling fluid from the formation to be tested".

Appellees use at different times three different forms of packers corresponding to this element of claim 15. Figure 3 of Exhibit 16-B (II, 225) shows a "rat-hole" packer corresponding exactly to the packer illustrated in the Simmons patent. Figure 2 of Exhibit 16-C (II, 226) shows this packer seated in the well bore to seal off the formation from the drilling fluid above the packer. The packers shown in Figures 2 and 4 of Exhibit 16-B (II, 225) are known as "full hole packers"; but it is not suggested that the Simmons apparatus claims are restricted to any par-

ticular form of packer. These types of packers are used interchangeably by both plaintiffs and defendants. All three meet the specifications of claim 15 that the packer is "adapted to be positively pressed against the walls of the formation to seal off the same".

The next element of claim 15 is:

"means at the lower end of said string of pipe to receive fluid from said formation including an inlet opening into said pipe below said packer and a valve structure for controlling the inlet".

The inlet below the packer is clearly shown by the part marked "Perforated Nipple 66" in Fig. 3, and by the part marked "Perforated Nipple" in Fig. 2 of Exhibit 16-B (II, 225). The valve structure for controlling the inlet, specified in claim 15, is the main valve 41 and the renewable seat 40.

The concluding element of claim 15 reads:

"said valve structure having a relatively stationary part connected to the packer and a relatively movable part connected to the pipe".

The part marked "Renewable Seat 40" of the main valve of appellees' tester is rigidly connected with the packer, and the part of the main valve marked "Main Valve 41" is rigidly connected by mandrel 11, housing 7, and collar 6 to the drill pipe 5.

The application of the other apparatus claims in suit (9 to 14, 16, 17 and 19) to defendants' apparatus may be made in a similar manner. The valve composed of the main valve 41 and renewable seat 40 is the valve "positively controlled by movement of the pipe". This is conceded in defendants' interrogatory answers, where defendants state:

"When the drill stem is lifted it will draw the main valve 41 to a closed position and will then lift the

packer from its seat, thus allowing the drill string and the tool to be withdrawn from the well with an entrapped sample" (I, 85).

The fact that defendants add various auxiliary valves to their apparatus cannot vary the fact that defendants employ each of the elements of the apparatus claims and, as expressly held by Judge Wilbur (I, 532), does not avoid infringement. These auxiliary valves, the trip valve, the equalizing valve, and the circulating valve, are merely safety valves for an emergency. The trip valve is used only as a precaution in the event the main valve opens accidentally while being lowered into the well. After being tripped it performs no function in the testing of the well (I, 429). The circulating valve is used only in emergency and, if used, the test is abandoned (I, 202). The equalizing valve is merely a device to lessen the pull required to unseat the packer (I, 200), an old expedient commonly employed with packers (Exh. H-8; II, 244-6). The addition of these auxiliary valves does not avoid infringement. (Law Item No. 12, *post* p. 84).

Defendants in their brief misleadingly and unnecessarily introduce much confusion in their discussion of the fact that defendants accused single-string tester and plaintiffs' latest "J-slot" tool have an auxiliary valve on the testing string (drill string) so arranged that in an emergency arising during a test drilling mud may be forced down the test string and out at the bottom to reestablish circulation (see defts' brief pp. 6 and 67-8). Counsel say that defendants' accused tester, and plaintiffs' J-slot tool "actually provide for maintaining or reestablishing circulation, if deemed necessary by the operator" (p. 21). They fail to point out that circulation is not and cannot be maintained by these devices while the test is being taken; that when in an emergency the test string is used to reestablish the circulation it "spoils the test when we pump through it" (O'Neill I, 202 and see Abbott I, 318-9; Halliburton I, 501-2). This Court will understand, we believe, that when the single-string tester of Simmons' patent and

of defendants' use is thus equipped with this safety feature, and use is made of it in an emergency, the operator must for that operation sacrifice the use of the test string as a sample holder in accordance with the Simmons invention and revert to its use as a mud-circulating conduit—the use to which it was dedicated before Simmons' invention. It seems to us extravagant for defendants' counsel to suggest, as they do in their brief, that Simmons' invention in "the omission of both a casing and circulation, . . . really possesses no merit and has no use . . . conclusively showing that any thought Simmons may have had of dispensing entirely with circulation was impractical and was never commercially used either by himself or his successors in interest" (brief p. 67). It will be evident, we think, that the incorporation of this emergency safety device in plaintiffs' "J-slot" tool and in defendants' accused testing tool merely emphasizes the reality of the difficulties that confronted Simmons, and of the chances he took, when he devised a testing operation capable of being carried out so quickly that the test could be made during an interruption of the circulation of the drilling mud.

Defendants point to the fact that the main valve in their apparatus is operated by lowering and lifting the pipe, whereas the valve illustrated in the Simmons patent is operated by turning the pipe. The apparatus claims 9-17 and 19 here relied upon make no differentiation in this regard. They include either rotary or vertical movement of the pipe. There are other claims in the patent (claims 1-7) which are directed to the rotary valve construction, and under the familiar rule this limitation will not be read into the claims in which it is not expressed (Law Item 13, *post* p. 84).

Defendants in their argument assert (their brief p. 10) that defendants' accused device is "radically different from that of the patent in suit, and covered by its own patents" and consequently should be free from the charge of infringement. But the grant of an improvement patent

is no ground for declaring that the improvement is not an infringement of an earlier but broader patent (Law Item No. 14, *post* p. 84). The fact is, as we have already said (*ante* p. 57), that defendants are operating under the Johnston patent 1,709,940 during the prosecution of which Johnston sought for and obtained an interference with the application for the Simmons patent (II, 183; 190-4), thereby asserting that opening the valve by vertical movement of the pipe, as in defendants' accused device and in the Johnston patent application, is equivalent to opening it by turning the pipe as in Simmons.

The contention that respondent Honolulu Oil Corporation has not been shown to have employed the infringing method and apparatus but has merely employed respondent M. O. Johnston Oil Field Service Corporation, as an independent contractor to do so, is completely refuted by the record. The record shows that in the wells tested for Honolulu Oil Corporation the work was done jointly by Honolulu Oil Corporation and M. O. Johnston Oil Field Service, and that the latter was not a mere independent contractor for the former (I, 207-8; 386-7). This is a case of joint infringement. The Ninth Circuit Court of Appeals held: "We find that the Honolulu Oil Corporation participated jointly in infringement in using the process on the wells drilled by it" (I, 532).

Defendants' Assignments of Error and Points of Argument.

In defendants' brief the six assignments of error (p. 8) are developed in six points of argument summarized on the last half of page 10 and page 11. The defenses as thus stated are for the most part artificial and irrelevant to the facts of this case.

We state below our position with respect to these assignments of error numbered 1, 3, 4 and 5,* with our comments on some ancillary points made in defendants' brief.

*Assignment of error No. 2 is covered by our discussion of Franklin's patent *ante* pp. 21-37; and assignment of error No. 6, as to infringement, is covered *ante* pp. 61-7.

Defendants' Assignment of Error No. 1.

Defendants assert that "The method claims merely describe the function of an apparatus, designed and intended for a particular use" (brief p. 8, 37-43) and refer to the well established rule of this Court "that the *mere* function or effect * * * of a machine can not be the subject matter of a lawful patent." *Expanded Metal Co. v. Bradford*, 214 U. S. 366, 383 (emphasis ours). The emphasized word is important for this Court in that case immediately went on to say:

"But it does not follow that a *method of doing a thing*, so clearly indicated that those skilled in the art can avail themselves of mechanism to carry it into operation, is not the subject matter of a valid patent. The contrary has been declared in decisions of this Court" (p. 383, emphasis ours). See also *Carnegie Steel Co. v. Cambria Iron Co.*, 185 U. S. 403, 424.

It is not objectionable, therefore, that in carrying out the process, mechanism is required to be used; it is only where the process consists *merely* in the function or effect of the machine that the law denies protection to the process.

It is clear that the Simmons process is not the mere function or effect of the apparatus or tool used in carrying out the process, since without an ordered manipulation of this tool to perform the series of steps of the Simmons process, the process will not result. As Judge Wilbur found (I, 532) "The process in suit is not the function of a machine; it requires manual operation". The Simmons tool has no inherent law of operation which of itself leads inevitably to the performance of the steps of the process. The Simmons apparatus may be lowered into the well and yet nothing will happen until the apparatus is manipulated. Nor will arbitrary manipulation of this tool result in the performance of Simmons' method or in the attainment of his result. The tool may be inserted into the well with the valve open, the packer may be set elsewhere than "above the formation", the valve may be

opened before instead of "after the packer is set", or the valve may be left open while the tool is being withdrawn. Any such variation from the steps called for by Simmons' method claims would be a variation from the Simmons process and any such variation would prevent attainment of Simmons' result. It is only by performing the particular series of steps of the Simmons process in the order described that the new result of the patent is attained. Inspection of the Simmons apparatus would not have enabled a man skilled in the art to attain this new result. Further knowledge would have been needed, a knowledge of the series of steps in accordance with which Simmons intended his apparatus to be operated, in short, the Simmons method.

With regard to the words "designed and intended for a particular use" in their statement of the law just above referred to, defendants develop the extraordinary argument that the Simmons method is unpatentable because it is described in the Simmons patent in connection with a testing tool found by the Ninth Circuit Court of Appeals to be unpatentable as a tool (defts.' brief pp. 6 and 40-3). They assert in their brief (p. 6) that this case "comes here as one of first impression" because, they say, they have been unable to find any case in which a method claim was held valid where claims for a particular apparatus described in the same patent as a useful instrumentality for carrying out the method, had been held invalid. Even if no cases existed in which this situation was presented, it would nevertheless not be one of first impression in any real sense because it is fully covered by the well established rule of this Court, that "the apparatus used in carrying out a process may be old and yet the process valid." Nevertheless, since defendants have been unable to find them, we call the Court's attention to two cases which presented exactly this situation. *Naivette v. Bishinger*, (E. C. A. 6) 61 F. (2d) 433, 436 and *Cameron Septic Tank Co. v. Village of Saratoga Springs* (C. C. A. 2) 159 Fed. 453, 463, 464. In the *Naivette* case the Court said (61 F. (2d) 436)

"There is no contradiction in sustaining validity of a process, which includes clamping as a step in a new combination, and yet to deny validity to the patent for a clamp as a unitary device."

Defendants' Assignment of Error No. 3

Defendants assert that "The method claims describe, at most, only a different use for the old device disclosed in the Franklin patent, which different use is itself old." (brief pp. 8, 11 and 45-7). They say that the pronouncement has been made many times by this Court that "The new use of an old apparatus is not invention" (their brief, p. 45). This, however, is not an accurate statement of the law as pronounced by this Court. Thus stated, the rule would conflict with the other well established principle that "the apparatus may be old and yet the process valid" which defendants recognize (brief p. 43). A correct statement of the rule is given in the leading case of *Pennsylvania R. R. v. Locomotive Truck Co.*, 110 U. S. 490, 494, referred to by defendant, where this Court said:

"the application of an old process or machine to a similar or analogous subject, with no change in the manner of application, and no result substantially distinct in its nature, will not sustain a patent, even if the new form of result has not before been contemplated."

This rule assumes that the application is (1) of an old process or old machine; (2) to a similar or analogous subject; (3) *with no change in the manner of application*; and (4) *with no result substantially distinct in its nature*.

More specifically, defendants' contention is that "Simmons made no changes in structure over Franklin," and "is not entitled to a patent merely for suggesting the application of the old Franklin device to a new or different use" (their brief, p. 46). A reading of the cases cited by defendants in support of this proposition (their brief, pp. 45-6) will disclose that in every instance the fault found with the patent was that it consisted in the application of

an old instrumentality (process or machine) to a new subject *in the same manner* as had been customary in the past. The "new use" lay in applying the old instrumentality in the old manner to a different but analogous subject. There was no change in the manner of application and no result substantially distinct in its nature. In the instant case (if we assume for the sake of argument that the apparatus of Franklin's patent required no change to adapt it to Simmons' purpose) the Simmons process is nevertheless not an old but a new process. Its novelty lies in a particular series of manipulations which constitute a *new manner of applying* the old tool nowhere suggested by, and antagonistic to, Franklin's procedure (see *ante* pp. 16-17 and 25-6). It is this change in the manner of application that gives to the Simmons procedure a new result substantially distinct in its nature, and never contemplated by Franklin. This novel series of manipulations is the new Simmons process. The doctrine of "new use" advanced by defendants has no application to this situation and the cases cited by defendants are, therefore, not pertinent.

The suggestion repeated at this portion of defendants' brief (p. 47) that by taking the prior art patents relating to well testing devices together with Franklin's patent, Simmons' method could be arrived at without invention, has already been discussed (*ante* p. 47). It has nothing to do with the doctrine of "double use".

Defendants' Assignment of Error Number 4.

Defendants' fourth assignment of error is that the method claims "depend for their novelty upon mechanical limitations, expressly placed there to evade the prior art" (defts.' brief pp. 8, 47-52).

The answer to this proposition is that it is not factually correct. The method claims 8 and 18 do not "depend for their novelty upon mechanical limitations". "The method claims, in their reference to apparatus, define not the apparatus itself but the *use of it* in Simmons' step-by-step procedure. The case is governed by those deci-

sions of this Court which have held valid novel methods which depend upon a defined use of mechanical instrumentalities (see *ante* pp. 68-9, and Law Item No. 15, *post* pp. 84-7).

We have already seen that a major distinction between the Simmons method and the procedures of Cox and Edwards lies in Simmons' conception of taking a sample "within a very few minutes" during a period of suspension of the circulation of the drilling mud, thereby emancipating the drill string from its supposedly indispensable function of a conduit for the circulating drilling mud, and making use of it as the sample chamber. Simmons undertook to express this novel idea, first conceived of by him and differentiating his method from what was previously known, in his patent claims. Defendants in their brief refer repeatedly, but somewhat indefinitely, to the fact that the Simmons claims were allowed after several rejections (their brief pp. 15, 20 and 48, for example). But examination of the file wrapper history (II, 10-110; see particularly pp. 60, 62-3, 66, 69, 76, 97, 99-100 and 102) will show that the applicant and the examiner, who recognized the patentability of the new idea, were endeavoring to find an appropriate expression for it in the method claims. The expression agreed upon was "a method of testing . . . involving the insertion of only a single string of pipe into the well" (claim 18), and " . . . lowering an empty string of pipe into the well" (claim 8). These are thoroughly adequate expressions of method, under the decisions of this Court. We submit that the method claims are not open to defendants' attack on the technical ground that this novel step in the process has been expressed in structural rather than abstract terms. The language of the method claims expresses throughout not a structure, but the use of a structure (see Law Item No. 15, *post* pp. 84-7).

There was therefore no error in the ruling of the Ninth Circuit Court of Appeals expressed by Judge Wilbur as follows (I, 532):

"Appellee further contends that the process claims are invalid because specifying apparatus to be used in the process . . . These contentions are without merit. A patent is not invalid because requiring specific apparatus in carrying it out. *Expanded Metal Co. v. Bradford*, 214 U. S. 366, 53 L. Ed. 1034; *Lawther v. Hamilton*, 124 U. S. 1, *supra*; *Owen v. Perkins Oil Well Cementing Co.*, 38 F. (2d) 30".

Defendants ask this Court to eliminate from the method claims (their brief p. 49) this feature of the invention thus expressed in the manner agreed upon between the applicant and the examiner, and to give no weight to this novel feature of Simmons' invention (their brief pp. 67-8). Defendants acknowledge that in a case where a patentee has eliminated a step of a prior process, yet secured the same or more, advantageous results, this alteration alone may amount to patentable invention, citing *Lawther v. Hamilton*, 124 U. S. 1. Defendants assert, however, that the instant case does not come within the rule of *Lawther v. Hamilton* but "really falls within the rule of *Richards v. Chase Elevator Co.*, 159 U. S. 477, 486, 16 S. Ct. 53, that the elimination of an element with its corresponding function does not amount to invention" since "When Simmons abandoned the second string * * * he also abandoned the function of such second string, viz.: to maintain * * * circulation" (defts.' brief, p. 68). But this is not a fair statement of the matter. In a rotary drilled well the function of the circulating mud and of the second string of pipe by which it is maintained is to support the walls of the hole and prevent cave-ins and "freezing" of the tools in the well (*ante*, p. 8). This is undisputed. In the Simmons process both the circulation and the second string are dispensed with, but their function is retained. The walls of the hole are still maintained and the testing tool does not "freeze" in the well. The result of the process, in this respect, is the same as before. The advantages over the old processes have already been pointed out. It is submitted that this situation falls clearly within the rule of *Lawther v. Hamil-*

ton as reaffirmed in *Richards v. Chase*;^{*} and that this element of novelty in the Simmons process may be given full weight by this Court.

Furthermore, as we have previously pointed out, the omission of the circulation and the use of the drill string as the sample chamber is not the only important distinction between the Simmons method and that of Cox and Edwards. Neither Cox nor Edwards discloses any procedure for entrapping and lifting to the surface an uncontaminated sample from which the possible production of the formation may be measured, so that in any event it is clear that defendants' argument based on the assertion that "the only novelty" of the method claims resides in structural limitations, is without foundation.

Defendants' Assignment of Error No. 5.

Defendants assert that "The method claims are not the subject matter of patent protection at all" (brief, pages 8, 52). In support of this contention they rely on the definition of a process given in *Cochrane v. Deener*, 94 U. S. 780, 788:-

"A process is a mode of treatment of certain materials to produce a given result. It is an act or a series of acts, performed upon the subject matter to be transformed and reduced to a different state or thing".

The reference to a change of the subject matter to a different state or thing, defendants interpret as requiring either the production of a tangible new product or a change in physical or chemical character of an old product. They say that Simmons' method "changes nothing except the location of that sample," of oil entrapped in the testing device and therefore is not a patentable process (brief p. 54).

^{*}The rule of the *Lawther Case* was reaffirmed in *Richards v. Chase* where the Court said: " * * * the omission of an element in a combination may constitute invention, if the result of the new combination be the same as before * * * " (159 U. S. 477, 486).

We do not think that in the *Cochrane v. Deener* case this Court intended to restrict the scope of a patentable process in the way suggested by defendants. The reference to a change of the subject matter to a "different state" as well as to a different "thing" seems to us to exclude the necessity of an actual physical change in the thing acted upon. This interpretation, rather than defendants' brings it into harmony with this Court's definitions of a process in other cases both before and after the decision in *Cochrane v. Deener*. See *Corning et al. v. Burden*, 15 How. 252, 268; *Tilghman v. Proctor*, 102 U. S. 707, 728; *The Telephone Cases*, 126 U. S. 1, 532; *Expanded Metal Co. v. Bradford*, 214 U. S. 366, 382-6; *Waxham v. Smith*, 294 U. S. 20, 21-2.

In *Eames v. Andrews*, 112 U. S. 40, 54, the process consisted "in the new application of a power of nature, by which new application a new and useful result is attained. There is no new product, but an old product—water—is obtained from the earth in a new and advantageous manner." (See also definition of same process in *Beedle v. Bennett*, 122 U. S. 71, 78).

Certainly if the removal of water from the earth "in a new and advantageous manner" is a patentable process, then the removal of oil from the earth in a new and advantageous manner is likewise a fit subject matter of patent protection. Again, separating oil from the earthy formation in which it occurs cannot be significantly distinguished from separating valuable mineral from the earthy gangue with which it is commingled, yet this Court held such a process patentable in *Mineral Separation v. Hyde*, 242 U. S. 261. Similarly the method of withdrawing molten metal from a furnace which was subjected to the scrutiny of this Court in *Keyes v. Grant*, 118 U. S. 25, 28, seems to us indistinguishable from "a method of moving an object from one place to another" which defendants declare to be unpatentable subject matter (defts.' brief p. 54).

We submit that defendants' interpretation of *Cochrane v. Deener* must be rejected.

THE LAW APPLICABLE TO THIS CASE

Item 1. This Court has always considered that novelty in the means and in the result is the primary test of invention. In *Expanded Metal Co. v. Bradford*, 214 U. S. 366, this Court, in sustaining Golding's patent for a method of producing expanded metal, which method involved mechanical operations, said (p. 381):

"There is nothing in the prior art that suggests the combined operation of the Golding patent in suit. It is perfectly well settled that a new combination of elements, old in themselves, but which produce a new and useful result, entitles the inventor to the protection of a patent. *Loom Co. v. Higgins*, 105 U. S. 580, 591."

See also *Potts v. Creager*, 155 U. S. 597, 608.

It is not, of course, sufficient that the process merely be new in the sense that it had never existed before. If the improvement was so plainly indicated by the prior art that when the need became apparent the art had "ready at hand the knowledge which would enable one skilled in the art to satisfy it", then the process is lacking in patentable novelty. *DeForest Radio Co. v. General Electric Co.*, 283 U. S. 664, 682, 685. If, for instance, the method of the patent in suit had been suggested in the Franklin patent and its applicability to the testing of rotary drilled wells had been recognized, this knowledge would defeat the novelty of the process in the sense of the patent law even though the process had not actually been so applied. The reason for this is plain enough, for the purpose of the patent law is to reward those who actually make some contribution to the sum of human knowledge.

In the instant case there is, however, no suggestion of the Simmons method in Franklin's patent nor is there any other evidence of any knowledge on the part of those skilled in the art that such a process could be applied to produce Simmons' new result. The evidence is that those skilled

in the art were unable to solve the problem although they had unsuccessfully tried to do so in several ways. Upon the evidence the world owes its knowledge that such a process can be used to Simmons.

Thus from an *objective* viewpoint, the method of the patent in suit fully responds to the test of invention established by this Court.* It is only by approaching the subject from a *subjective* viewpoint and speculating after the event and without evidence, on what might or might not have been obvious to a man skilled in the art, that one can possibly deny to the method of the patent in suit the attributes of a patentable invention. It is by this process of reasoning as to what might or might not have been obvious to a man skilled in the art that the Court of Appeals for the Fifth Circuit reached its decision. (88 F. (2d) 270-3)

We submit that where the evidence shows that a patentee has attained a new result in a manner not clearly suggested by the prior art, patentability follows as a conclusion of law and courts should not speculate without any evidence and after the event as to what might or might not have been obvious to the man skilled in the art. As this Court pointed out in *Diamond Rubber Co. v. Consolidated Tire Co.*, 220 U. S. 428, 435, "the law has other tests of the invention than subtle conjectures of what might have been seen and yet was not."

Item 2. There are many cases, however, where it is not clear from the evidence whether the advance made by the patentee is really new or whether it is indicated in the prior art with sufficient certainty to negative novelty. In

*Smith v. Goodyear, etc., Co., 93 U. S. 486, 492-7; New Process, etc., Co. v. Maus, 122 U. S. 413, 423-7; Seabury v. Am Ende, 152 U. S. 561, 567; Diamond, etc., Co. v. Consolidated etc., Co., 220 U. S. 428, 435-43; Eibel Process Co. v. Minn., etc., Co., 261 U. S. 45, 52, 68; Minerals Separation v. Hyde, 242 U. S. 261, 266-70; Holland, etc., Co. v. Perkins, etc., Co., 277 U. S. 245, 255; DeForest, etc., Co. v. General Electric Co., 283 U. S. 664, 678-9.

such cases this Court has looked to the history of the art to resolve the doubt and determine from the actual experience of the industry whether or not the knowledge available at that date was indeed such as to make available for the purpose the very means disclosed and claimed in the patent.

Evidence that the defects in existing testing methods for rotary drilled wells had long been recognized, that attempts of earlier inventors to solve the problem had resulted in failure and that the process of the patent in suit solved the problem, leads inevitably in the instant case to the conclusion that the art did not have "ready at hand the knowledge which would enable one skilled in the art to satisfy" the existing need. *DeForest Radio Co. v. General Electric Co.*, 283 U. S. 664, 685. This Court has time and again relied upon objective evidence of this kind either in confirmation of its finding of novelty or to resolve any doubt which it had on that score. For instance, in *Loom Co. v. Higgins*, 105 U. S. 580, this Court said (p. 591):

"But it is plain from the evidence, and from the very fact that it was not sooner adopted and used, that it did not, for years, occur in this light to even the most skillful persons. * * * Now that it has succeeded it may seem very plain to any one that he could have done it as well. This is often the case with inventions of the greatest merit."

Again, in *Expanded Metal Co. v. Bradford*, 214 U. S. 366, this Court said (p. 381):

"It may be safely said that if those skilled in the mechanical arts are working in a given field and have failed after repeated efforts to discover a certain new and useful improvement, that he who first makes the discovery has done more than make the obvious improvement which would suggest itself to a mechanic skilled in the art, and is entitled to protection as an inventor."

In the case of *Consolidated Valve Co. v. Crosby Valve Co.*, 113 U. S. 157, this Court said (p. 179):

"The fact that the known valves were not used, and the speedy and extensive adoption of Richardson's valve, are facts in harmony with the evidence that his valve contains just what the prior valves lacked, and go to support the conclusion at which we have arrived on the question of novelty."

In *Potts v. Creager*, 155 U. S. 597, this Court said (p. 608):

"The apparent simplicity of a new device often leads an inexperienced person to think that it would have occurred to any one familiar with the subject; but the decisive answer is that with dozens and perhaps hundreds of others laboring in the same field, it had never occurred to any one before. The practised eye of an ordinary mechanic may be safely trusted to see what ought to be apparent to every one."

See also to the same effect *Carnegie Steel Co. v. Cambria Iron Co.*, 185 U. S. 403, 422; *Keystone Mfg. Co. v. Adams*, 151 U. S. 139, 144; *Hildreth v. Mastoras*, 257 U. S. 27, 34-5.

This Court has frequently relied upon evidence of immediate adoption of the invention, particularly where the invention has supplanted existing methods, as persuasive not only that the patentee has made a valuable contribution to the useful arts but also that this contribution was not within the knowledge available to the man skilled in the art for, if it had been, it is natural to suppose that such a valuable improvement would have been adopted sooner to fill the existing need. See *Hobbs v. Brach*, 180 U. S. 383, 393; *Topliff v. Topliff*, 145 U. S. 156, 164; *Sessions v. Romadka*, 145 U. S. 29, 44; *New Process etc. Co. v. Maus*, 122 U. S. 413, 424; *Minerals Separation Co. v. Hyde*, 242 U. S. 261, 270; *Eibel Process Co. v. Minnesota etc. Co.*, 261 U. S. 45, 68.

Item 3. The apparent incredulity of well drillers that the Simmons scheme was feasible and their unwillingness to risk their wells in what seemed to them so radical and hazardous an undertaking further strikingly demonstrates the novelty of Simmons' invention.

See *Eibel Process Co. v. Minnesota etc., Co.*, 261 U. S. 45, 55 and 60; *McKee et al. v. Graton & Knight Co.*, (C. C. A. 4), 87 F. (2d) 262, 263; *National Battery Co. v. Richardson Co.* (C. C. A. 6); 63 F. (2d) 289, 292; *Straub v. Campbell* (C. C. A. 3) 259 Fed. 570, 571.

Item 4. Judge Wilbur's finding of novelty is supported in this case by the action of the patent office in issuing the patent after a consideration of the same prior art that is now relied upon by defendants. This action of the patent office is presumed to be correct. *Agawam Co. v. Jordan*, 7 Wall. 583, 597; *Mitchell v. Tilghman*, 19 Wall. 287, 390; *Diamond Rubber Co. v. Consolidated Tire Co.*, 220 U. S. 428, 434. This presumption has increased weight where as here the patent has undergone close scrutiny by the various tribunals of the patent office in interference proceedings. *Hildreth v. Mastoras*, 257 U. S. 27, 32. See also to the same effect *Radio Corp. v. Radio Engineering Labs.*, 293 U. S. 1, 7.

Item 5. It is well settled that in order to defeat the novelty of a patented invention by means of prior printed publications or patents, the description contained in the earlier publication must

"exhibit a substantial representation of the patented improvement, in such full, clear, and exact terms as to enable any person skilled in the art or science to which it appertains, to make, construct, and practice the invention to the same practical extent as they would be enabled to do if the information was derived from a prior patent. Mere vague and general representations will not support such a defence * * *." (*Eames v. Andrews*, 122 U. S. 40, 66)

Seymour v. Osborne, 11 Wall. 516, 555;
Cohn v. United States Corset Co., 93 U. S. 366,
 370;
Carnegie Steel Co. v. Cambria Iron Co., 185 U. S.
 403, 419-20;
Tilghman v. Proctor, 102 U. S. 707, 711-12;
Topliff v. Topliff, 145 U. S. 156, 161;
Skelly, etc., Co. v. Universal, etc., Co., C. C. A. 3,
 31 F. (2d) 427, 431.

"A document [patent] so obscure in its terminology that two conflicting theories may be deduced therefrom and supported by equally plausible arguments is too indefinite to be utilized as an anticipation." (*Cimiotti Unhairing Co. et al. v. Comstock Unhairing Co.*, 115 Fed. 524)

Item 6. The rule is well established in this Court that slight changes, otherwise within the range of mechanical skill, are enough to give the changed apparatus the status of a patentable invention if the changes were dictated by a new purpose first disclosed by the patentee.

In *National Cash Register Co. v. Boston, etc., Co.*, 156 U. S. 502, this Court, in sustaining a claim for an improvement in cash register machines, said (p. 514):

"Given these [the patentee's] conceptions, it was more a matter of mechanical skill than of invention to devise such connection, since a similar train of mechanism had been operated by the keys for other purpose. * * * While the use was to a certain extent an analogous one and the mechanism was probably suggested by that employed to ring the bell, there was nothing to suggest that the object to be obtained * * * could be accomplished by subdividing the force exerted by the key * * *"

In *Consolidated Valve Co. v. Crosby Valve Co.*, 113 U. S. 157, the Court in sustaining a patent for a valve said (p. 171):

"Taught by Richardson, and by the use of his apparatus, it is not difficult for skilled mechanics to take the prior structures and so arrange and use them as to produce more or less of the beneficial results first made known by Richardson; but, prior to 1866, though these old patents and their descriptions were accessible, no valve was made producing any such results."

See also *Hobbs v. Beach*, 180 U. S. 383, 391; *Topliff v. Topliff*, 145 U. S. 156, 161, 163; *Eibel Process Co. v. Minnesota, etc., Co.*, 261 U. S. 45, 66-7.

Item 7. It is well settled that ex parte tests regarding the ability of prior devices to perform the function of the device of the patent in suit have little weight, are subject to grave suspicion, and every doubt should be resolved against them where it appears that the prior device was never in fact used to perform the function of the patent in suit. *Carnegie Steel Co. v. Cambria Iron Co.*, 185 U. S. 403, 420-1; *Kuehnsted v. Farbenfabriken, etc., Co.* (C. C. A. 7), 179 Fed. 701, 707; *Carson v. American, etc., Co.* (C. C. A. 9), 4 F. (2d) 463, 465-6; *Chadeloid Chemical Co. v. Wilson etc. Co.* (D. C. S. D. N. Y.), 220 Fed. 681, 682.

Item 8. Success is not anticipated by failure. Where the patentee is the first to solve a problem, his right to a patent cannot be defeated by the work of others no matter how close they may have come to success, if their efforts actually resulted in failure.

The *Telephone Cases*; 126 U. S. 1, 544-5; *Consolidated Valve Co. v. Crosby Valve Co.*, 113 U. S. 157, 170-1, 179; *Carnegie Steel Co. v. Cambria Iron Co.*, 185 U. S. 403, 422, 429, 446; *The Barbed Wire Patent Case*, 143 U. S. 275, 282-4; *Hall Signal Co. v. General Ry. Signal Co.* (C. C. A. 2), 169 Fed. 290.

Item 9. The persuasive effect of widespread success of the patented invention is not to be denied to the patentee

because the specific embodiment of his invention described in his patent may have been improved upon either by the patentee or by others. *Sessions v. Romadka*, 145 U. S. 29, 43, 45; *Tempco Co. v. Apco Co.*, 275 U. S. 319, 324-5, 328; *Hildreth v. Mastoras*, 257 U. S. 27, 34.

Defendants' contention that the commercial success of the patent in suit, in order to benefit the patentee, "must be confined to the device shown and described in such patent" (brief, p. 15), is not supported by any authority. The case of *Duer v. Corbin etc. Co.*, 149 U. S. 216, cited by defendants, is not in point. In that case the device of the patent had considerable commercial success and the Court said (223-4):

"Were the question of patentability one of doubt this might suffice to turn the scale in favor of the patentee."

The Court, however, felt constrained to hold the patent invalid because it was lacking in novelty.

Item 10. The burden of proof to make good the defense of prior invention is "upon the party setting it up," and "every reasonable doubt should be resolved against him". *Coffin v. Ogden*, 18 Wall. 120, 124; *Cantrell v. Wallick*, 117 U. S. 689, 695-6; *The Barbed Wire Patent*, 143 U. S. 275, 285; *Deering v. Winona Harvester Works*, 155 U. S. 286, 301; *Radio Corp. v. Radio Engineering Labs. Inc.*, 293 U. S. 1, 7.

Item 11. Infringement of a method claim is not avoided by a variation in the structural form of the apparatus used in applying the method. *Smith v. Snow*, 294 U. S. 1, 20; *Warham v. Smith*, 294 U. S. 20, 23; *Tilghman v. Proctor*, 102 U. S. 707, 730-2; *Cochrane v. Deener*, 94 U. S. 780, 788-9; *Expanded Metal Co. v. Bradford*, 214 U. S. 366, 383-4.

Item 12. Infringement is not avoided, where the substance of the invention is adopted, by the addition to the combination claimed of additional apparatus such as auxiliary valves. *Machine Co. v. Murphy*, 97 U. S. 120, 124-5; *Hobbs v. Beach*, 180 U. S. 383, 401; *1900 Washer Co. v. Kraemer* (C. C. A. 3), 169 Fed. 629, 633-4; *Voices v. Uneeda Doll Co.* (C. C. A. 2), 32 F. (2d) 673, 675.

Item 13. Limitations contained in certain apparatus claims of the patent will not be read into other apparatus claims in which these limitations are not included. *Smith v. Snow*, 294 U. S. 1, 13-14; *Symington v. National Casting Co.*, 250 U. S. 383, 385; *Lampson, etc. Co. v. Hellman* (C. C. A. 7), 123 Fed. 416, 419; *National Tube Co. v. Mark* (C. C. A. 6), 216 Fed. 507, 521; *Electric etc. Co. v. General Electric Co.* (C. C. A. 2), 88 F. (2d) 11, 16.

Item 14. Where a defendant has adopted the substance of the patented invention, he infringes the patent even though he may have improved upon the invention, and this is true irrespective of whether defendant's improvement is patentable or not. *Cochrane v. Deener*, 94 U. S. 780, 787; *Machine Co. v. Murphy*, 97 U. S. 120, 125; *Cantrell v. Wallick*, 117 U. S. 689, 694; *Tempco v. Apco*, 275 U. S. 319, 328.

Item 15. It is perfectly proper to include reference to structure in a method claim. Defendants apparently assert the contrary. They say "To be patentable, a method must be independent of the function or utility of any particular piece of apparatus. *Tilghman v. Proctor*, 102 U. S. 707, 722" (brief, p. 48). The *Tilghman* case is authority for the proposition that a process may be patented irrespective of the particular machine or mechanical device for carrying out the process. But it was recognized by the Court that reference to structure is not out of place in a process patent for it was said "Neilson's patent was for the process of applying the hot blast to furnaces by forcing

the blast *through a vessel or receptacle* situated between the blowing apparatus and the furnace and heated to a red heat; the form of the heating vessel being stated by the patent to be immaterial. These views were sustained after the strictest scrutiny and against the strongest opposition" (102 U. S. 722). There is a discussion of this same Neilson patent in *O'Reilly v. Morse*, 15 How. 62, 115-16.

This court has frequently sustained process claims which have included references to mechanical instrumentalities as an element thereof. Thus in the early cases of *Mowry v. Whitney* a claim for a process of making wheels for rail-cars was sustained although one step of the process called for "*depositing (the wheels) in a previously-heated furnace or chamber, so constructed, of such materials, and subject to such control that the temperature of all parts of the wheels deposited therein, may be raised to the same point . . .*" (14 Wall. 620, 29).

In *Cotton-Tie Company v. Simmons*, 106 U. S. 89, 92, a claim for "*the method of baling cotton with metallic bands . . . by bending the same at any desired point into the form of a loop, and passing such loop sidewise through an open slit into the slot intended to receive it and over the bar of the clasp intended to hold it*" was held valid and infringed.

In *Keyes v. Grant*, 118 U. S. 25, 28, the lower court directed a verdict of invalidity for lack of invention over the prior art. This Court reversed the decision on the ground that the question should have been put to the jury. The claim in that case read: "*The method of tapping or withdrawing molten lead or other metals from a smelting furnace by means of the basin B and tube or connection C, in combination with the furnace substantially as shown and described.*" The patent was later sustained by the Circuit Court and no appeal taken. (*Keyes v. Pueblo Smelting, etc., Co.*, 36 Fed. 179).

In the recent case of *Smith v. Snow*, 294 U. S. 1, "The method of hatching a plurality of eggs by arranging them at different levels in a closed chamber having restricted

openings of sufficient capacity for the escape of foul air without undue loss of moisture, etc. * * *” was sustained as a valid process claim. In a subsequent case this claim was attacked as being for the function of the machine disclosed. The defense was rejected (*Waxham v. Smith*, 294 U. S. 20, 21-2).

In *Lawther v. Hamilton*, 124 U. S. 1, the question was discussed at some length. The patent related to a process of treating linseed to extract oil therefrom. In the prior art process the seeds were passed through rollers under pressure, then ground by muller-stones and finally treated with steam and thoroughly mixed prior to being subjected to pressure to extract the oil therefrom. Lawther, the patentee, observed that if sufficient care were taken each seed could be crushed while passing through the rollers and that further grinding was injurious. He accordingly omitted the second step in the process—grinding by muller-stones.

The lower Court dismissed the bill, saying that Lawther had “simply omitted one of the instrumentalities previously used in the first stage of treatment of the seed. This was undoubtedly a useful improvement, but it was not the invention or discovery of a new *process*. . . . The discovery or invention was not of a new series of acts or steps constituting a process, but only of certain mechanical changes in carrying into effect the well-known old steps of the process.” (emphasis ours)

This Court reversed the lower court’s decision, saying (124 U. S. 6):

“The view thus taken by the court below seems to us open to some criticism. If, as that court says, and we think rightly says, the omission of the muller-stones is a real improvement in the process of obtaining the oil from the flax-seed; if it produces more oil and better oil-cakes, and it is new, and was not used before; why is it not a patentable discovery? And why is not such new method of obtaining the oil and making the

oil-cakes a process? There is no new machinery. The rollers are an old instrument, the mixing machinery is old, the hydraulic press is old; *the only thing that is new is the mode of using and applying these old instrumentalities. And what is that but a new process?* This process consists of a series of acts done to the flaxseed. It is a mode of treatment. The first part of the process is to crush the seed between rollers.

But whilst we are satisfied that the invention is that of a process, it is nevertheless limited by the clear terms of the specification, at least so far as the crushing of the seed is concerned, *to the use of the kind of instrumentality described*, namely, in the first part of the process, *to the use of powerful revolving rollers for crushing the seed between them under pressure.*" (emphasis ours.)

So in the present case, the Simmons method of extracting oil from a formation in a well filled with drilling fluid is limited "to the use of the kind of instrumentality described", a single string of pipe. The use of a single string of pipe and its manipulation in the manner described by Simmons is a step in the Simmons process which is new and patentably distinguishes it from the methods of Cox and Edwards which involved as an essential step the operation of two strings of pipe in the well to maintain circulation.

It is perfectly plain from the foregoing cases that this Court has never rejected a patent for a process merely because the process involved the use or manipulation of tools. It hardly need be pointed out that the process of extracting a quantitative sample of oil from a formation located at the bottom of a hole below thousands of feet of drilling fluid is not one that can be performed by hand. The use of tools is absolutely necessary and to declare a claim invalid because it refers to the instrumentalities which are essential to the performance of the steps of the process would be absurd.

CONCLUSION.

We submit, therefore, that on the facts and the law the decision of the Ninth Circuit Court of Appeals upholding Simmons' method claims was correct and should be affirmed by this Court, and that because of errors of law and fact the holding that Simmons' apparatus claims 8 to 17 and 19 are invalid should be reversed and those claims held valid and infringed. .

Respectfully submitted,

FREDERICK S. LYON,
WILLIAM H. DAVIS,
LEONARD S. LYON,
HENRY S. RICHMOND,
BEN F. SAYE,

for Plaintiffs.

APPENDIX**FINDINGS OF JUDGE BRYANT**

IN

THE CASE

OF

**ERLE P. HALLIBURTON and HALLIBURTON OIL WELL
CEMENTING Co.**

VS.

**JOHNSTON FORMATION TESTING CORP. and
EDGAR C. JOHNSTON.**

**IN THE UNITED STATES DISTRICT COURT FOR THE
EASTERN DISTRICT OF TEXAS.**

**FINDINGS OF FACT AND CONCLUSIONS OF
LAW.**

Filed September 5, 1935.

1.

Plaintiff, Erle P. Halliburton, is an inhabitant of the State of California, residing at Los Angeles, in said state, and said plaintiff, Halliburton Oil Well Cementing Company, is a corporation organized and existing under and by virtue of the laws of the State of Delaware and authorized to do business in the State of Texas.

2.

The defendant, Johnston Formation Testing Corporation, is a corporation organized under and by virtue of the laws of the State of Delaware, and authorized to do

business in the State of Texas, and having a regular and established place of business in Gregg County, Texas, within the Tyler Division of the Eastern District of Texas, and there engaged in the business of manufacturing, selling and using apparatus for testing formations encountered in wells and of practicing methods of testing formations in wells.

3.

The defendant, E. C. Johnston, is the President of the defendant, Johnston Formation Testing Corporation, and that the said E. C. Johnston resides at Longview, in Gregg County, in the Eastern District of the State of Texas.

4.

John T. Simmons, a resident of El Dorado, Arkansas, was the original and first inventor of a new and useful invention, to wit, "Method and Apparatus for Testing the Productivity of Formations Encountered in Wells" not known or used by others before his invention or discovery thereof, or patented or described in any printed publication in the United States of America, or any foreign country before his invention or discovery thereof, or more than two years prior to his application for Letters Patent thereon in the United States of America, or in public use or on sale in the United States of America for more than two years prior to such application for Letters Patent therefor, and not abandoned; on the 10th day of February, 1926, the said John T. Simmons made an application in writing in due form of law to the Commissioner of Patents of the United States of America for Letters Patent on said invention, complying in all respects with the requirements of said law, said application being known as Ser. No. 87,323.

5.

By assignment in writing the said John T. Simmons assigned, transferred and set over to the plaintiff, Erle

P. Halliburton, all of the right, title and interest in and to said application for Letters Patent for "Method and Apparatus for Testing the Productivity of Formations Encountered in Wells" and the inventions described and disclosed therein, and requested the United States Patent Office to issue any and all Letters Patent issued on said application to Erle P. Halliburton.

6.

After due proceedings had and due examination made by the Commissioner of Patents upon the aforesaid application as to the patentability of said invention, on October 17th, 1933, Letters Patent of the United States of America, No. 1,930,987, signed, sealed and executed in due form of law and bearing date the day and year aforesaid, were granted, issued and delivered by the Commissioner of Patents of the United States to the aforesaid plaintiff, Erle P. Halliburton.

7.

On or about the 9th day of October, 1933, by an instrument in writing the plaintiff, Erle P. Halliburton, granted to plaintiff, Halliburton Oil Well Cementing Company, a corporation of the State of Delaware, for the full term of and under any and all Letters Patent granted or procured on said application for Letters Patent Ser. No. 87,323, filed February 10th, 1926, unless sooner terminated as in such written instrument provided, the sole and exclusive right, license and liberty to employ the inventions described and claimed in and by application for Letters Patent, Ser. No. 87,323, and the invention described and claimed in said Letters Patent No. 1,930,987; in and throughout the United States of America and the territories thereof, upon the terms and conditions in said instrument set forth, including the payment of a royalty upon each and every testing job performed under said license by said plaintiff, Halliburton Oil Well Cementing Company to

plaintiff Erle P. Halliburton; by the terms of said agreement and at all times since the 17th day of October, 1933, said plaintiff Halliburton Oil Well Cementing Company was to have, and has had, the sole and exclusive right, license and liberty to employ said invention patented in said Letters Patent in and throughout the United States of America, and the territories thereof.

8.

Since the issuance of the Letters Patent in suit, on the 17th day of October, 1933, and at the time of the commencement of this suit, Erle P. Halliburton, plaintiff above named, was the sole and exclusive owner of the entire right, title and interest in and to the Letters Patent aforesaid, and Halliburton Oil Well Cementing Company, plaintiff above named, was the sole and exclusive licensee under said Letters in and for all the states and territories of the United States.

9.

Plaintiffs have developed a large business in this and foreign countries under the patent in suit and the apparatus for testing formations in wells and the methods of testing formations in wells have come into universal use and have become the standard apparatus and methods employed in testing the formations encountered in the drilling of oil wells throughout the oil producing fields of the United States; that said inventions have been and are of great benefit and have saved the oil industry millions of dollars.

10.

Prior to the discovery of the inventions disclosed and claimed in said Letters Patent by the said John T. Simmons, there was no apparatus or method in use for testing the productivity of formations encountered in drilling wells containing drilling fluid whereby a sample of the cognate fluid from the formation to be tested could be ob-

tained except by setting a string of casing in the well adjacent to the formation to be tested and then bailing or pumping or otherwise removing the drilling fluid from the casing.

11.

Letters Patent in suit, No. 1,930,987, and particularly Claims 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19 thereof, describe and define a new and patentable invention and are good and valid in law.

13.

From October 17th, 1933, and up to the time of the trial of this cause, the defendant Johnston Formation Testing Corporation has been engaged in the business of manufacturing, selling and using apparatus, and of practicing methods utilizing the inventions of the Letters Patent in suit without license so to do, and has evidenced its intention to continue such business unless enjoined therefrom.

14.

The testing apparatus manufactured, used and sold by the defendants comprised a string of pipe to be lowered into a well having an inlet at its lower end and carrying a packer adapted to be positively pressed against the walls of the formation to seal off the same above the inlet, and a valve for the inlet positively controlled by movement of the pipe to open and close the inlet while the packer is seated.

15.

The testing apparatus manufactured, used and sold by the defendant comprised a string of pipe to be lowered into the wells, a packer carried by the pipe, said packer adapted to be positively pressed against the walls of the formation to seal off the same and means at the lower

end of the pipe to receive a sample from the well including an inlet and a valve for controlling the inlet, the valve being positively controlled by movement of the pipe to open and close the inlet while the packer is seated.

16.

The testing apparatus for testing wells containing drilling fluid manufactured, used and sold by the defendants included an empty string of pipe to be lowered in the well to adjacent the formation to be tested, means at the lower end of the pipe to receive a sample from the formation including an inlet opening into the pipe and a valve for controlling the inlet, and means carried by the pipe for sealing the well above the inlet, said means consisting of a packer adapted to be positively pressed against the walls of the formation to seal off the same, the valve being positively controlled by movement of the pipe.

17.

The testing apparatus for testing wells containing drilling fluid manufactured, used and sold by the defendants included a single string of pipe to be lowered into the well to adjacent the formation to be tested, a valved inlet at the lower end of the pipe positively controlled from the top of the well by movement of the pipe and a packer carried by the pipe above the inlet, said packer being adapted to be positively pressed against the walls of the formation to seal off the same.

18.

The testing apparatus for testing wells containing drilling fluid manufactured, used and sold by the defendants included an empty string of pipe to be lowered into the well to adjacent the formation to be tested, a packer carried by the pipe adapted to be positively pressed against the walls of the formation to seal off the same, means at

the lower end of the pipe to receive a sample from the formation including an inlet opening into the pipe and a valve structure for controlling the inlet, the valve structure including a plurality of relatively movable parts one of which is secured to the pipe and another of which is connected to the packer.

19.

The testing apparatus for testing wells containing drilling fluid manufactured, used and sold by the defendants included a single empty string of pipe to be lowered into the well to adjacent the formation to be tested, means lowered into the well by said string of pipe for sealing off the drilling fluid from the formation to be tested, said sealing means being adapted to be positively pressed against the walls of the formation to seal off the same, means at the lower end of said string of pipe to receive a sample from the formation including an inlet opening into said pipe and a valve structure for controlling the inlet, said valve structure including a part connected to said sealing means and a part connected to said pipe.

20.

The testing apparatus for testing wells containing drilling fluid manufactured, used and sold by the defendants comprised a single empty string of pipe to be lowered into the well through the drilling fluid to adjacent the formation to be tested, a packer lowered into the well by said string of pipe for sealing off the drilling fluid from the formation to be tested, said packer adapted to be positively pressed against the walls of the formation to seal off the same, means at the lower end of said string of pipe to receive fluid from said formation including an inlet opening into said pipe below said packer, and a valve structure for controlling the inlet, said valve structure having a relatively stationary part connected to the packer and a relatively movable part connected to the pipe.

21.

The testing apparatus for testing wells containing drilling fluid manufactured, used and sold by the defendants comprised a single empty string of pipe to be lowered into the well through the drilling fluid to adjacent the formation to be tested, a packer carried by the pipe for sealing off the well above the formation, an inlet below the packer opening into the pipe, said packer adapted to be positively pressed against the walls of the formation to seal off the same, and a valve for the inlet, the setting of the packer and the operation of the valve being positively controlled by movement of the pipe.

22.

The testing apparatus for testing wells containing drilling fluid manufactured, used and sold by the defendants comprised a single string of pipe to be lowered into the well through the drilling fluid, said pipe being closed against the entrance of the drilling fluid, means at the lower end of the pipe for receiving a sample including an inlet opening into the pipe, means carried by the pipe for sealing the well above the inlet, said sealing means adapted to be positively pressed against the walls of the formation to seal off the same and a valve for the inlet that may be positively opened and closed by movement of the pipe while the well is sealed above the inlet.

23.

The testing apparatus for testing wells containing drilling fluid manufactured, used and sold by the defendants comprised a string of pipe to be lowered into the well through the drilling fluid to adjacent the formation to receive a fluid sample therefrom and to be raised out of the well to remove the entrapped sample, said pipe being closed against the flow of the drilling fluid as the pipe is

lowered into the well, a packer carried by the pipe as the pipe is lowered into the well and adapted to be seated by manipulation of the pipe to seal off the well above the formation, said packer adapted to be positively pressed against the walls of the formation to seal off the same, an inlet to the pipe communicating with the well below the point at which the packer seals off the well, and means for controlling the inlet to permit fluid from the formation to enter the pipe while the packer is set and to prevent fluid from entering the pipe after the packer is released and the pipe is being raised out of the well.

24.

The method practiced by the defendants in testing the productivity of formations encountered in a well containing drilling fluid included the lowering of an empty string of pipe into the well through the drilling fluid to adjacent the formation, the pipe carrying a packer and having a valved inlet at its lower end which is closed while the pipe is being lowered setting the packer above the formation to seal off the drilling fluid from the formation, opening the valved inlet after the packer was set to permit cognate fluid from the formation to enter the pipe, closing the valved inlet against the entrance of fluid from the well by movement of the pipe, raising the pipe so closed to remove an entrapped sample and the packer from the well.

25.

The method practiced by defendants in testing the productivity of formations encountered in wells containing drilling fluid involved the insertion of only a single string of pipe into the well to make a test, which included lowering a test string into the well through the drilling fluid with a packer carried by the string and a valve inlet at the lower end of the string closed against the entrance of fluid from the well, setting the packer above the formation

and opening the valve to permit cognant fluid from the formation to enter the inlet, closing the valve to prevent the subsequent entrance of fluid from the well through the inlet and releasing the packer, and raising the test string with the inlet closed against the entrance of fluid from the well to remove an entrapped sample.

26.

The defendants, Johnston Formation Testing Corporation, a corporation, and E. C. Johnston, were duly notified in writing of the infringement of letters patent in suit complained of herein October, 1933, and during the entire life of the patent have had knowledge of said Letters Patent.

27.

The defendants have infringed upon each of Claims 9, 10, 11, 12, 13, -14, 15, 16, 17 and 19, by manufacturing, selling and using apparatus like devices illustrated and described in plaintiffs' Exhibit 14.

28.

The defendant Johnston Formation Testing Corporation has infringed upon each of claims 8 and 18 by practicing the methods set out in Findings 24 and 25 herein.

29.

The Stewart Patent No. 171,589, defendants' Exhibit 15, describes a woven hemp packer and has no valve in the inlet below the packer. Such device does not and cannot be operated to control the flow of cognate fluid from a formation into the pipe.

30.

The Franklin Patent No. 263,330, defendants' Exhibit 20, describes a device to control and regulate the flow

of a completed oil well and to keep oil from flowing through the tubing when it is being put into the well or withdrawn from it. This device of the Franklin patent does not contain the elements necessary to test a formation in a well. An entrapped sample could not be removed from a well with this device because it is so constructed that any fluid in the pipe above the part D will escape between the part D and the part C when the tubing is being removed from the well. This device has no packer by which the well can be sealed above the formation to be tested from the drilling fluid contained in the well. In fact it is a device to be used where no drilling fluid is contained in the well.

31.

The Cooper Patent No. 1,000,583, defendants' Exhibit 24, is for a packer for operating gas, water and oil wells and does not disclose an apparatus or method for testing the productivity of formations encountered during drilling a well. The Cooper device is for use in a completed well for recovering gas and oil from a well formation which includes water strata with oil or gas strata. The Cooper patent does not disclose a method or apparatus for recovering an entrapped sample of fluid, but discloses an apparatus and method of securing fluid from an oil or gas well by pumping or bailing. The Cooper patent does not disclose an apparatus or method using a single string of pipe, but the apparatus and method of the Cooper patent requires the use of two strings of pipe.

32.

The Cox patent No. 1,347,534, defendant's Exhibit 25, is for a device for testing wells for oil, gas, etc. The Cox tester employs two tubes or pipes while the patent in suit employs but a single pipe. If operable at all, Cox's device must employ both of the pipes that his patent describes and discloses. Cox's device does not have a valve which is operated by movement of the pipe. The Device

of the Cox patent has no valve which can be controlled to prevent the entrance of drilling fluid into the test tube when the apparatus is being withdrawn from the well. The Cox patent does not disclose or teach the methods of Claims 8 and 18 of the patent in suit.

33.

The Edwards patent No. 1,514,585, defendants' Exhibit 28, is for a device for testing wells for oil, gas, etc. The Edwards tester employs two tubes or pipes while the patent in suit employs but a single pipe. The Edwards patent does not describe an apparatus or method of testing a well by which a sample from the well may be entrapped and the pipe raised so that the sample can be examined. The Edwards patent discloses an apparatus and method in which a pump is used to pump out the fluid from the stratum, where the fluid is under insufficient pressure to flow from the apparatus. The Edwards patent contemplates a different method of operation than the Simmons patent. The device of the Edwards patent requires both of the pipes 1 and 8, and the pipe 1 must carry the packer. The pipe 8 and sleeves 7 of the Edwards patent could not be used for testing a well without the simultaneous use of the outer pipe 1 and the packer 5. When the pipe 8 and sleeve 7 of the Edwards device are raised from the well, the pipe 8 will not be maintained closed.

34.

None of the prior patents pleaded and introduced in evidence by the defendant, viz: Kewley 58,837; Burr and Wakelee 68,350; Carll 73,577; Stewart 171,589; Birge 193,915; Koch 208,610; Stewart 230,080; Dowar 249,228; Franklin 263,330; Cavallaro 524,666; McGregor 582,828; Bloom 785,933; Cooper 1,000,583; Cox 1,347,534; Halliday, 1,474,680; Boynton 1,508,771; Edwards 1,514,585; and Macready 1,522,197; (Defendants' Exhibits 12 to 29 inclusive).

describe a method or an apparatus adapted for determining the productivity of a formation encountered in drilling a well which requires the insertion of only a single string pipe or tester in the well; nor do any of the patents just enumerated describe or disclose a method or apparatus adapted to recover an entrapped sample of cognate fluid from a formation encountered in drilling a well.

35.

That an Interlocutory Decree be entered in this cause finding that the Letters Patent in suit are valid and that Claims 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19, have been infringed as aforesaid, directing an injunction be issued restraining the defendants from further infringement of the Letters Patent in suit and referring this cause to a Special Master to ascertain the profits and damages derived from or arising out of the infringement of said Letters Patent by the defendants.

36.

The Simmons patent in suit is the first patent to disclose an apparatus and method for testing the productivity of formations encountered in drilling a well requiring only a single strip of pipe or tubing.

37.

The apparatus and methods of the patent in suit were not in open, notorious public use by Charles R. Edwards of Houston, Texas, for more than two years, or for any other period, or at all, prior to the filing date of the application for Letters Patent in suit No. 1,930,987.

38.

The apparatus and methods of the patent in suit were not in open, notorious public use by Walter C. Parks of

Iowa Park, Texas, for more than two years, or for any other period, or at all, prior to the filing date of the application for Letters Patent in suit, No. 1,930,987.

39.

The inventions of the patent in suit were not disclosed nor communicated directly or indirectly to John T. Simmons by Charles R. Edwards of Houston, Texas.

40.

The inventions of the patent in suit were not disclosed nor communicated directly or indirectly to John T. Simmons by P. E. Carter of Shreveport, Louisiana.

41.

The inventions of the patent in suit were not disclosed nor communicated directly or indirectly to John T. Simmons by Hubert E. Philp of Shreveport Louisiana.

42.

John T. Simmons is the sole, only and original, inventor of the inventions disclosed and claimed in United States Letters Patent in suit No. 1,930,987, and was not a joint inventor of the same with P. E. Carter and Hubert E. Philp, or either of them, or with any other person or persons.

The foregoing findings of fact and conclusions of law are hereby settled and adopted this 5th day of September, 1935.

RANDOLPH BRYANT,
United States District Judge.

SUPREME COURT OF THE UNITED STATES.

Nos. 466, 479.—OCTOBER TERM, 1938.

Honolulu Oil Corporation, Ltd. and
M. O. Johnston Oil Field Service
Corporation, Petitioners,

466 vs.

Erle P. Halliburton and Halliburton
Oil Well Cementing Company.

Erle P. Halliburton and Halliburton
Oil Well Cementing Company, Peti-
tioners,

479 vs.

Honolulu Oil Corporation, Ltd. and
M. O. Johnston Oil Field Service
Corporation.

On Writs of Certiorari to
the United States Cir-
cuit Court of Appeals
for the Ninth Circuit.

[April 17, 1939.]

Mr. Justice BUTLER delivered the opinion of the Court.

This suit presents questions of validity and infringement of Patent No. 1,930,987 applied for February 10, 1926 by Simmons and, after assignment, issued October 17, 1933, to Halliburton. It is for a method and apparatus for testing productivity of formations encountered in oil and other deep wells drilled by the rotary method.

The writs were granted, on petition of defendants Honolulu Oil Corporation, Ltd. et al. and cross-petition of plaintiffs Halliburton, et al., to review a decree¹ of the circuit court of appeals for the ninth circuit holding that the method claims are valid and infringed and to that extent reversing a decree² of the district court of southern California holding that the method and apparatus claims are invalid.

¹ 98 F. (2d) 436.

² 18 F. Supp. 58.

There was an earlier suit for infringement of the same patent brought by these plaintiffs in the federal court for the eastern district of Texas against other defendants. That court sustained the patent and found it infringed. The circuit court of appeals for the fifth circuit reversed.³ It held the method claims invalid for lack of invention and that, while the apparatus claims may define a simplifying improvement upon which a combination patent might rest, the apparatus was not of such character as to be infringed by the accused tool of defendants.

In recent years rotary drilling has been widely used in sinking deep oil wells. Boring is done by rotation of a bit attached to a steel pipe which when so used is called a "drill stem." A smaller bore, called "rat-hole", sometimes precedes, and is reamed out to obtain the full size hole. To aid operation, drilling fluid (mud-laden water) is pumped into the upper end of the drill stem and escapes into the well at high velocity through holes in the bit. It rises through the space between the pipe and the earth walls of the well and carries to the surface cuttings made by the bit. It holds back and seals the penetrated formations. Hydrostatic pressure of the drilling fluid is very great and the fluid in a penetrated formation will not flow into the well unless it is under greater pressure. It is often desirable to secure a sample of the fluid within a stratum in the bottom of the well without removing the drilling fluid. The patent in suit is for a method and apparatus intended to accomplish that purpose.

The method claims are 8 and 18. Claim 8 is as follows: "A method of testing the productivity of a formation encountered in a well containing drilling fluid, which includes lowering an empty string of pipe into the well through the drilling fluid to adjacent the formation, the pipe carrying a packer⁴ and having a valved inlet at its lower end which is closed while the pipe is being lowered, setting the packer above the formation to seal off the drilling fluid from the formation, opening the valved inlet after the packer is set to permit cognate fluid⁵ from the formation to enter the pipe.

³ 88 F. (2d) 270.

⁴ Webster's New International Dictionary, 2nd ed., 1935: "packer . . . A device to pack the space between the wall of a well and the pipe or between two strings of pipe in a well."

⁵ That is, oil, gas, water, or other fluid encountered in formations penetrated by the bit.

closing the valved inlet against the entrance of fluid from the well by movement of the pipe, raising the pipe so closed to remove an entrapped sample and the packer from the well." Claim 18 is printed in the margin.⁶

The apparatus claims in suit are 9 to 17 inclusive and 19. Claim 15 is typical: "Apparatus for testing the productivity of a formation encountered in a well containing drilling fluid, comprising a single empty string of pipe to be lowered into the well through the drilling fluid to adjacent the formation to be tested, a packer lowered into the well by said string of pipe for sealing off the drilling fluid from the formation to be tested, said packer adapted to be positively pressed against the walls of the formation to seal off the same, means at the lower end of said string of pipe to receive fluid from said formation including an inlet opening into said pipe below said packer and a valve structure for controlling the inlet, said valve structure having a relatively stationary part connected to the packer and a relatively movable part connected to the pipe."

Sustaining the claims in suit, the district court for eastern Texas found: Plaintiffs have a large business under the patent in suit. Prior to the discovery there was no apparatus or method in use for testing productivity of formations in wells containing drilling fluid except by putting in a casing and removing the fluid. This patent first disclosed testing apparatus and method requiring only a single string of pipe.

In this suit the trial court found: The Franklin Patent No. 263,330, dated August 29, 1882, anticipates both the method and apparatus covered by the patent in suit. The use of a packer is necessarily implied from the language of the Franklin patent. Without one, that device could not perform the functions attributed to it. Plainly, it may be used as a tester: for by its use the contents of the producing stratum, sealed off from the rest of the well and unimpeded in its entry into the rat-hole by pressure of the rotary mud, can be brought undiluted to the surface by a mechan-

⁶ 18. A method of testing the productivity of a formation encountered in a well containing drilling fluid involving the insertion of only a single string of pipe into the well to make a test, which includes lowering a test string into the well through the drilling fluid with a packer carried by the string and a valve inlet at the lower end of the string closed against the entrance of fluid from the well, setting the packer above the formation and opening the valve to permit cognate fluid from the formation to enter the inlet, closing the valve to prevent the subsequent entrance of fluid from the well through the inlet and releasing the packer, and raising the test string with the inlet closed against entrance of fluid from the well to remove an entrapped sample.

ism almost duplicating that shown by the patent in suit. A packer to separate one stratum of the oil well from another is old in the art.

And it also found: The Cox Patent No. 1,347,534, dated July 27, 1920, and the Edwards Patent No. 1,514,585, dated November 4, 1924, substantially disclose the method and device claimed in the patent in suit. The object of these patents, like that of the one in suit, was to ascertain productivity of the stratum being drilled. There was no actual commercial use of the device disclosed and claimed in the patent in suit. It was impractical, due to difficulty in operating at increased length. The inventor himself was employed to devise improvements in the valve structure. If valid at all, the patent must be restricted to its precise form. The method claims are invalid for want of invention. In important respects, defendants' devices differ in operation from the device disclosed and claimed by the patent in suit; they are not infringements of it.

And that court decreed that as to all claims in suit, the patent is invalid.

The opinion of the circuit court of appeals for the fifth circuit considers the questions of invention here involved. In substance, it says:

Method claim 18, taken as typical, assumes familiar apparatus and claims a monopoly on a new use of the old apparatus to achieve a result in a better way. That apparatus includes a single string of pipe lowered into the well, a packer on the string, and a valve at the lower end. These simple and well-known elements are to be used by lowering the pipe into the well with the valve closed against the drilling fluid until the packer is set, then by opening the valve to admit cognate fluid below the packer, then by closing the valve so as to prevent the drilling fluid from entering when the packer is released and the pipe drawn up with its contents. No novelty and certainly no invention can be claimed for the method.

Packers and pipes with valves in them have long been in use to get what is below the packer free from what is above and without removing what is above. Whether a large quantity from a finished well or a simple sample from an unfinished well does not materially alter the method. Water has always been encountered in oil wells; the drilling fluid is only very muddy water voluntarily put and kept in the well for special reasons. Expansible and removable packers with pipes through them to reach the oil, gas, or other de-

sired fluid beneath and rat-hole packers set by the weight of the pipe pressing them down and removable by simply lifting them are shown in earlier patents.⁷

The simplicity of the method in suit along with all its operations, was reasonably disclosed in the old patent to Franklin. There is the single pipe with a packer mentioned, but function esteemed so familiar as to need no emphasis, capable of being lowered into and withdrawn from a well, with the entrance into or escape from the pipe to be controlled by a valve operated from above while the pipe is lowered or withdrawn. The importance of Franklin to this method claim is that he describes the use of a packer on a single string of pipe with a valve in the pipe in the very operation of putting them in and taking them out of the well. Franklin discloses a packer. Evidently one must be used for without it oil would not flow through the pipe as desired and there would be no use of the valve to control the flow. The packer is necessary to prevent escape of gas and to build up pressure to make the oil flow.

Franklin did not intend to get a sample by raising the pipe, but intended to keep from getting a sample by making the valve a leaky one that would let the contents escape as the pipe is raised. He expected to get what was below by natural flow just as Simmons, applicant for the patent in suit, says that is to be preferred. It would be no invention to substitute a valve that would not leak for one that was intended to and does leak on withdrawal. It would be no invention to use the Franklin device to sample a well instead of using it to flow the well. Especially after the disclosure of Cox and Edwards in the art of testing by sample taken through the drill stem with their somewhat complicated devices, recurrence for this new use to what is in substance the simple apparatus of Franklin ought not to be the foundation for the broad method claims here put forth. While perhaps not anticipated, they involve no such invention as entitles to monopoly.

The apparatus claims have a different status. They propose a new machine to better accomplish the useful result. They were rewritten to state for the first time that only a single string of pipe is to be used. In view of the oil well art, the omission of the Edwards second pipe to maintain circulation involves no such inven-

⁷ The opinion refers to Stewart, No. 171,589, December 28, 1875; Stewart, No. 230,080, July 13, 1880; Koch, No. 208,610, October 1, 1878; Bloom, No. 785,933, March 28, 1905; McCready, No. 1,522,197, January 6, 1925; and Cooper, No. 1,000,583, August 15, 1911.

tion as to give a monopoly of all single string testers as is here claimed. It may be a simplifying improvement on which to rest a combination patent but it is not a basic and pioneer invention. Positive pressure of the packer against the well walls, also written into the claims, appears to refer to the weight of the pipe on the rat-hole packer, but that is the way a rat-hole packer has always worked. The claims in suit can not be sustained in all their breadth but must be limited to the form of the apparatus disclosed.

The circuit court of appeals for the ninth circuit, upon considerations in substance the same as those suggested in the opinion of the circuit court of appeals for the fifth circuit, held that the apparatus claims of the patent in suit were anticipated by the patent to Franklin. But, holding that invalidity of apparatus claims does not negative discovery of method or process, that court in substance said:

The Franklin patent directs the pipe to be lowered into the well and the valve to be operated by movement of the pipe so as to control the flow of oil. It teaches that the tube can be kept empty by closing the valve while it is being lowered and that it should be closed prior to its removal. The device is to be used in a flowing well which, of course, contains no drilling fluid. At the time of that patent the rotary method of drilling was unknown. Its purposes were to provide a method of keeping the tubing closed while being lowered into or removed from the well and means of temporarily closing the tubing to allow the gas in the well to obtain sufficient head so that the well would flow. There is disclosed no use for taking entrapped samples from unfinished wells containing drilling fluid. There is no suggestion of this last step of the patented process; the device was evidently intended to be permanently attached to the tubing of the well.

Simmons, applicant for the patent in suit, faced the problem of providing a method of testing an oil well without removing hydrostatic pressure necessary for support of the formation in question. He met it by a method operating so quickly that the suspension of the circulation of drilling fluid was not substantially greater than that frequently necessary in drilling operations. Franklin neither considered nor solved this problem.

The Simmons discovery constituted invention. It disclosed what had not been thought possible in the art, that is, that such a device could be set in a well containing drilling fluid not in circulation

long enough to make the test; it substituted a much better process than had been in use. The discovery was that a well could be safely tested by lowering a single string of pipe equipped with a valve packer and strainer and that it was not necessary to set the casing permanently and bail out the drilling fluid; or, if a test were attempted without permanently setting the casing, it was not necessary to provide an extra string of pipe for circulation of the drilling fluid.

1. Plaintiffs, insisting that the apparatus claims are not invalid for lack of invention, emphasize the fact that the Franklin apparatus was intended to be used to govern flow of a finished well and not for testing productivity of formations encountered in drilling; they maintain that it is not adapted to the last mentioned use without significant changes and they suggest that even a very slight change is enough to give patentability to the changed apparatus if the change is foreign to the purposes of the Franklin apparatus and dictated by those of the apparatus in suit. They say that the essential features of the latter, not found in the Franklin patent, are a packer so related to the inlet that it may seal off the formation to be tested from the hydrostatic pressure of the mud-laden fluid standing in the well during the testing operation, a valve so positioned with respect to the packer inlet that when closed it will entrap the entire flow of the cognate fluid to result from natural pressure in the formation when relieved from pressure of the drilling fluid, and so constructed that it will hold and bring to the surface the entrapped sample uncontaminated and undiminished.

The specification of Franklin's patent states that his invention consists in providing a device which can be connected with the tubing of the well above a "packer." On ample evidence, the trial and appellate courts found that packers to separate the producing strata from the others were old in the art, and that the use of a packer, substantially as the same exists today, is necessarily implied from the language of the Franklin patent. Detailed description by Franklin was unnecessary. *Webster Loom Co. v. Higgins*, 105 U. S. 580, 586.

Franklin's specification states that the device containing the valve should be "preferably . . . above the packer" and that "it may be placed deep in the well and thereby obtain considerable advantage." This indicates a valve just above the packer as is true

with respect to the patent in suit. But even assuming the contrary, in view of prior art as disclosed by the Cox and Edwards patents, the location of the valve as indicated by the patent in suit is mere mechanical contrivance and not invention. *Hollister v. Benedict Manufacturing Co.*, 113 U. S. 59, 73.

It is assumed, as claimed by plaintiffs, that the valve of the Franklin device was made so that it would let the contents of the pipe escape while it was being taken out of the well. But by mere substitution of a tight valve for a leaky one the device would be made to hold and bring up samples from the formation below the packer. The difference between the Franklin valve, leaking while being drawn from the well, and that of the patent in suit, purposely made to close tightly, is not an essential or patentable element.

In wells where there exists natural pressure in the formation below the packer sufficient to force the fluid to the surface, either device, the Franklin or the one in suit, may be used to control flow of the well and so disclose the productivity of that stratum. It is equally plain that, in the absence of adequate pressure to carry to the surface, the Franklin device with a valve effectively closed would, if operated in accordance with the method claimed in the patent in suit, similarly receive, hold, and bring to the surface samples from the formation.

The apparatus claims are invalid.

2. As used in the statute,⁸ "useful art" includes method which in this case is used interchangeably with process; "machine" includes apparatus.⁹ Having held the apparatus not new, we come to the question whether claims 8 and 18 cover any new method or process.¹⁰ These claims relate to "a method of testing." The claims relating to the device call it an "apparatus for testing." In the method claims¹¹ and in some relating to apparatus,¹² the phrases just quoted are followed by identical words: "the productivity of a formation encountered in a well containing drilling

⁸ 35 U. S. C. § 31.

⁹ *Corning v. Burden*, 15 How. 252, 267.

¹⁰ See *Risden Locomotive Works v. Medart*, 158 U. S. 68, 77, 79. *Expanded Metal Co. v. Bradford*, 214 U. S. 366, 383. *Tilghman v. Proctor*, 102 U. S. 707.

¹¹ Claims 8 and 18.

¹² Claims 13, 14, 15, 16, 17, 19.

fluid."¹³ The elements to be employed in taking the steps constituting the method are essentially the same as those constituting the apparatus. The process consists of "lowering an empty string of pipe," "setting the packer," "opening the valved inlet," "closing the valved inlet," "raising the pipe so closed to remove an entrapped sample and the packer from the well." The result to be achieved by the method claimed to be new is precisely the same as that for the attainment of which the apparatus found to be old was contrived.

As already shown the Franklin apparatus served to bring out uncontaminated the oil yielded by the stratum below the packer. The method practiced by its use includes in the same order all the steps, except the last one, that constitute the process in question. That step is the raising of the pipe containing the entrapped sample. As the Franklin device was to control flow and not to

¹³ To show identical subject matter in the two sets of claims, defendants present an analysis of method claim 18 and apparatus claim 19 in parallel arrangement as follows:

18.

A method of testing the productivity of a formation encountered in a well containing drilling fluid involving

the insertion of *only a single string of pipe* into the well to make a test,

which includes lowering *a test string* into the well through the drilling fluid

with *a packer* carried by *the string* and *a valve inlet* at the lower end of the *string* closed against the entrance of fluid from the well,

setting *the packer* above the formation

closing *the valve* to prevent the subsequent entrance of fluid from the well through *the inlet* and releasing *the packer*, and raising the test string with the inlet closed against entrance of fluid from the well to remove an entrapped sample.

19.

An apparatus for testing the productivity of a formation in a well containing drilling fluid comprising

a string of pipe

[*a string of pipe*] to be lowered into the well through the drilling fluid to adjacent the formation . . . and to be raised out of the well to remove the entrapped sample, *a packer* carried by *the pipe* as the pipe is lowered into the well *an inlet* to *the pipe* communicating with the well below the point at which *the packer* seals off the well,

[*the packer* is] adapted to be seated by manipulation of *the pipe* to seal off the well above the formation, *said packer* adapted to be positively pressed against the walls of the formation to seal off the same,

and means for controlling *the inlet* to permit fluid from the formation to enter *the pipe* while *the packer* is set and to prevent fluid from entering *the pipe* after *the packer* is released and *the pipe* is being raised out of the well [to remove the entrapped sample].

test productivity of strata reached before completion of wells, the final movement to be taken in the process under consideration was not involved or described. But that movement is substantially disclosed by the Cox and Edwards patents. No discussion, in addition to the convincing exposition by the circuit court of appeals for the fifth circuit, is required to show that the method claimed in suit was clearly indicated in the prior art. It cannot reasonably be held that anything more than mechanical skill of men familiar with known methods of obtaining oil from formations below packers would be required to suggest the raising of the pipe containing fluid entrapped and held by effective closing of the valve.

The method claims are invalid.

The part of the decree of the circuit court of appeals brought up by defendants' petition is reversed. The part brought up by plaintiffs' petition is affirmed. The decree of the district court is affirmed.

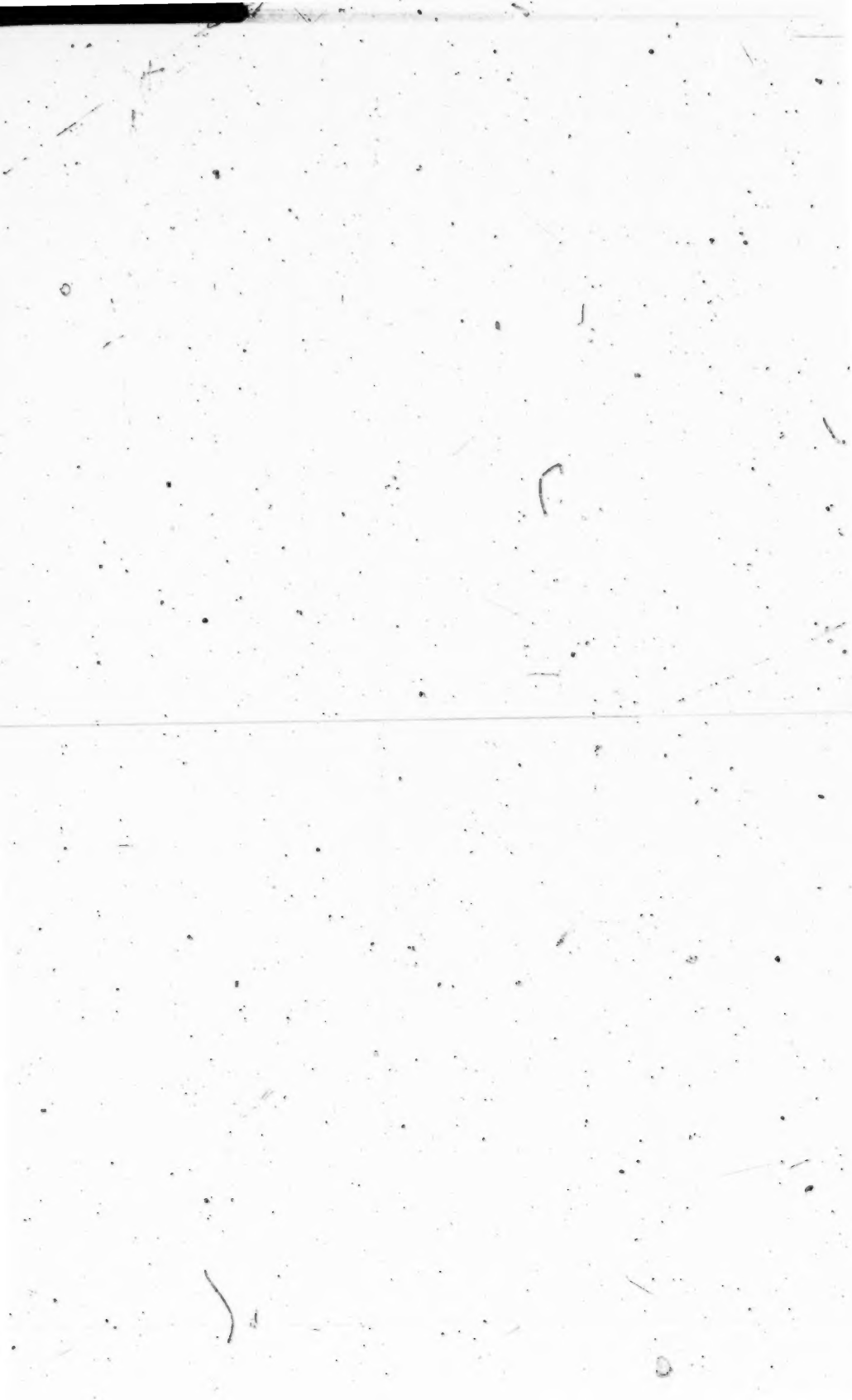
It is so ordered.

The CHIEF JUSTICE took no part in the consideration or decision of this case.

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